“I could be the king of rubbish!” Children’s perspectives on their role as ‘guardians of the Earth’.

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He iti kopara. Pioi ana te tihi o te kahikatea. *"The bellbird may be small but it has the strength to shake the very top of the kahikatea tree." Size is not an accurate indication of one's strength. Though small in stature, enormous in strength. Do not under estimate anyone's capability.*

Abstract

As we move forward from the United Nations Decade of Education for Sustainable Development, it is timely to investigate how early childhood education for sustainability is shaping an ethic of care and responsibility for the environment amongst young children. Early childhood is regarded as the critical period for the formation of positive environmental attitudes where social action towards change can take place.

This thesis provides insights into the complex nature of young children's perspectives on their role as guardians of the Earth, or kaitiakitanga, and early childhood education for sustainability. This case study followed a qualitative research methodology. The participants of this research were three and four year old children, attending a kindergarten. The flexible evolving interpretive approach allowed for a range of ways to participate.

The main source of data was rich narrative observations and recordings of the children's discussions, actions, work, learning stories and every day play episodes in the children's natural setting. Analysis of the data generated themes that highlighted the children's views and understandings of their role as guardians of the Earth.

An ecosystem, as a metaphor and conceptual tool, is used to draw attention to the layers and complexities of the children's perspectives and actions. Characteristics of a complex biotic community of unity, relationships, interactions and all the parts and pieces needed to keep an ecosystem healthy were brought to the fore.

The findings emphasise the value and importance children place on their role as guardians of the Earth. Functioning as a part of a team, taking action, and caring for their environment mattered greatly to them. The children's views were supported by the kindergarten programme and the adults around them. The research findings draw attention to implications for early childhood education for sustainability programme development and teacher practices. A case is put forward for initial and ongoing teacher education across all educational sectors, as well as creating future pathways where children are supported in their role as guardians (kaitiakitanga).

Abbreviations

EE - Environmental Education

ECE - Early Childhood Education

EfS - Education for Sustainability

ECEfS - Early Childhood Education for Sustainability

IPCC - Intergovernmental Panel on Climate Change

OMEP – World Organization for Early Childhood Education

UN - United Nations

UNESCO - United Nations Educational, Scientific and Cultural Organisation

UNDESD - United Nations Decade of Sustainable Development

UNCED - United Nations Conference on Environment and Development

WCED - World Commission on Environment and Development

WWF - World Wildlife Fund

Glossary

Ako: Describes a teaching and learning relationship, where the educator is also learning from the student and where educators' practices are informed by the latest research and are both deliberate and reflective (Williams, Broadley & Te-Aho, 2012).

Awhi: Support (Williams, Broadley & Te-Aho, 2012).

Kaitiakitanga: "is the obligation, arising from the kin relationship, to nurture or care for a person or thing. It has a spiritual aspect, encompassing not only an obligation to care for and nurture not only physical well-being but also mauri [life-force]" (Waitangi Tribunal, 2011, p. 8).

Kaupapa Māori: the underlying and fundamental principles, beliefs, knowledge and values held by Māori (Williams, Broadley & Te-Aho, 2012).

Kura: Māori language immersion schools where the philosophy and practices reflect Māori cultural values (Moorfield, 2011).

Mana: Prestige, authority, control, power, influence, status, spiritual power, charisma. Mana is a supernatural force in a person, place or object (Moorfield, 2011).

Manākitanga: The process of showing respect, generosity and care for others (Williams, Broadley & Te-Aho, 2012).

Māori: The indigenous peoples of Aotearoa New Zealand (Moorfield, 2011).

Mauri: Life principle, vital essence, special nature, a material symbol of a life principle, source of emotions - the essential quality and vitality of a being or entity. Also used for a physical object, individual, ecosystem or social group in which this essence is located (Moorfield, 2011).

Papatuanuku: Earth (Moorfield, 2011).

Tamariki: Children (Moorfield, 2011).

Tikanga Māori: Tikanga can be described as general behaviour guidelines for daily life and interaction in Māori culture (Moorfield, 2011).

Tuakana/teina: Learning from an older or more experienced person (Moorfield, 2011).

Waiora: Well-being (Moorfield, 2011).

Whānau: Family/ies, extended family/ies (Moorfield, 2011).

Chapter 1: Introduction

> *"But now," says the Once-ler, "Now that you're here, the word of the Lorax seems perfectly clear. UNLESS someone like you cares a whole awful lot, nothing is going to get better. It's not.*
>
> *~Dr.Seuss*[1]

What makes young children 'care an whole awful lot' about their environment and the world around them? Why do children take action? Adults often describe children as our future and devolve to them the responsibility of caring for our Earth, now and in the future. I do wonder if young children in an early childhood education setting in Aotearoa New Zealand, view themselves in such a light. These ponderings were the foundation on which this research began.

Mounting concern about the wellbeing of our planet has prompted a series of responses focusing on climate change, human rights, democracy and sustainable development. These responses are seen both nationally and internationally, and across many sectors, including government, business, and education. As we move forward from the United Nations Decade of Education for Sustainable Development (2005-2014), it is an opportune time to investigate if early childhood education for sustainability (hereafter referred to as ECEfS) is shaping an ethic of care and responsibility for the environment amongst young children. The children's views on this role are just as important. More than ever our focus should be on understanding the children's perspectives to ensure that education provides "learners across the world with

[1] From *'The Lorax'* (Seuss, 2006, p. 58)

the knowledge, skills and values to discover solutions to today's sustainable challenges" (UNESCO, 2014b, p. 3). My intention, as a teacher and researcher, was to explore if children placed as much value, care and importance on their role in conserving and sustaining the environment as I thought they did. If so, what directs children to take on this role? Is it the educational programme, their surroundings, an instinctive behaviour, or possibly all of these factors combined? These kinds of questions provoked me to explore and investigate possible answers. Such was the purpose of this thesis.

While there have been significant initiatives, and progress has been made through education for sustainable development, the scale of effort is still overshadowed by the scope of the problem. Formal, informal and non-formal education and learning processes for sustainability must be supported and highlighted. A need for a renewed commitment to education for sustainable development (or education for sustainability as it will be referred to in this research), as seen in the United Nations Ministerial Declaration on Education and Awareness-raising (2014), is required to bring the spotlight back on education.

> Education is the most powerful path to sustainability. Economic and technological solutions, political regulations or financial incentives are not enough. We need a fundamental change in the way we think and act. (Bokova (2012), cited in UNESCO, 2014b, p. 16)

I decided to be the 'Once-ler' and look for the moments where 'UNLESS' exists. I do this through exploring the intricacy of the children's thoughts on being guardians, and what this could mean for implementing strategies and possibilities for ECEfS. In this chapter I introduce the research topic and the background, context and rationale for this research. The research questions are posed and an outline of chapters is provided.

1.1 Background to the Research

Since the United Nations World Summit on Sustainable Development in 2002, the global implementation of sustainable development has been a challenge, but there has been some evidence of progress. The Montreal Protocol, for example has been successful in phasing out ozone-depleting substances, while Eco-city development is occurring in countries such as North America, Europe, and China. Yet there are still significant sustainability issues to be addressed (United Nations, 2015). The children of today are still going to inherit a world with economic, social, political and environmental challenges (Davis, 2008; Engdahl & Rabušicová, 2011). These challenges arise because we are not doing enough. Human beings continue to overstretch the Earth's life support systems, and as a species we have created a world of environmental hurt and diminishing natural resources through unfettered growth and overconsumption (United Nations, 2015). Unfortunately children are the most susceptible to the effects of a sick planet and, as environmental conditions worsen, will bear the future consequences of our present actions or inaction (Davis, 2008; Prince, 2010). Children today are facing a society that is rapidly shifting with new challenges and possibilities.

In spite of mounting global warming concerns and growing interest at international, national and local levels about sustainable practices, international and national research on ECEfS is still limited (Davis, 2009, 2010b). With this said the slow uptake in ECEfS is now gradually increasing especially through the international work of the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the World Organisation for Early Childhood Education (OMEP) and a number of advocates who have highlighted the profile of ECEfS. Traditional research has often focused on education *in* (young children's relationships with nature) and *about* (young children's understandings of environmental

topics and issues) the environment. At the time of her study, Julie Davis (2009) found few studies that examined young children's learning and capabilities in responding to sustainability issues, yet now there is a growing field of research which is showing improvement over the past five years. This research will add to this growing field. The same can be said for studies on education *for* the environment, a concept which is much more than playing in nature or studying nature. Davis (1998) describes education for the environment as "social critique and social action for change" (p. 119) and Professor Durie, a prominent Māori researcher, signaled the need to recognise that environmental protection is key to waiora (Cited in Ritchie, 2013b).

Early childhood education in Aotearoa New Zealand encompasses the care and learning of children from birth to six years of age. Early childhood is regarded as the critical period for the formation of positive environmental attitudes (Samuelsson & Kaga, 2008; Siraj-Blatchford, 2009) and where social action towards change can take place. Early childhood settings can be viewed as sites of possibility with regard to transformative education. As Ritchie (2010b) states,

> When educators in these services work closely with both tamariki and whānau, changes such as those required to move our collective societal consciousness towards ecological sustainability may be reinforced not only in the centre, but also in homes and further into the community. (p. 10)

It is important for children to develop an emotional bond to nature and an ethic of caring and respect for the natural world if they are to practice environmental sustainability as adults (Herbert, 2008). The United Nations Convention of the Rights of the Child states that children have a right to be heard in matters that are affecting them. In Agenda 21, the United

Nations agreement for global sustainable development from Rio 1992, children are recognised as important participants in the shaping of a sustainable future. Children will inherit the responsibility of looking after the Earth. Therefore their specific interests need to be taken into account to ensure the future of any actions taken to improve the environment. The Earth Charter, which is a universal declaration of fundamental ethical principles for building a just, sustainable and peaceful global society in the twenty first century (The Earth Charter Initiative, 2000) supports the United Nations Decade of Education for Sustainable Development (2005-2014) agreement. Through education for sustainability, children can be equipped with the values, attitudes, skills and knowledge to reform wasteful and destructive habits and work for a healthy, just and sustainable future as guardians of the Earth (Davis, 2008). As Engdahl and Rabušicová (2011) state, "participation and involvement are basic components of Education for Sustainable Development, with an emphasis on empowerment and agency for active citizenship, human rights and social change" (p. 156).

This thesis argues that it is necessary and worthwhile to explore ECEfS in relation to young children's active involvement in education *for* the environment, and the impact it has on children building ecological identity and consciousness. Specifically, the research investigates children's perspectives on their role as guardians of the Earth. The term 'guardians of the Earth' within this thesis, relates to the kaupapa Māori perspective to embrace kaitiakitanga; meaning a guardianship or protection of the natural world through stewardship and taking responsibility (Ritchie, 2010b). Kaitiakitanga relates to establishing an ethic of care through reciprocity and particular ways of understanding human relatedness to nature as being part of ourselves (Martin, 2007). Empowering children to be 'agents of change' (Davis, 2008; 2009) and active citizens in their communities and identifying what young children know, can understand, and can do about environmental issues was of

particular interest in this research. The term ‘agents of change’ relates to children being environmental stakeholders and proactive citizens, capable of influencing environmental outcomes.

1.2 Rationale and Key Research Questions

Early childhood education for sustainability and children’s views on being guardians of the Earth are the focus of this research. It examines the children’s perspectives and views on the importance of being guardians, and the value the children place on the environment. I discovered more about young children taking action when given the opportunity within this early childhood setting.

The setting for this research is the kindergarten where I teach and the participants were the children that attend this kindergarten. Initially the focus was on teaching that supports opportunities for child-directed inquiry. Child-directed inquiry became a specific focus for this study because this meant that the children led their own learning and had opportunities to wonder, create working theories and be curious about the world around them.

The intent of this research is to contribute to the more recent body of research literature that is arguably helping address the gaps in ECEfS research previously identified by Davis (2009). Davis exposed a research ‘hole’ in a preliminary survey of early childhood education for sustainability. She contended that the shortage of research to inform and support practice at that time has contributed to the sluggish and sporadic uptake of ECEfS, despite the fact

that a number of countries such as Korea, Sweden and Norway have included environmental education in their national curricula (Kwon, 2008; Norddahl, 2008). There are identified barriers for the slow uptake by early childhood education such as the general belief that childhood is a time of innocence and immaturity and that the bigger global environmental issues are too complicated and negative for children of such a young age to contend with. This view of children has contributed to an overall lack of research on education for sustainability (Duhn, 2012; Elliott & Davis, 2009; Gambino, Davis, & Rowntree, 2009; Siraj-Blatchford, 2009). This research starts to redress this issue. Gaps can only be filled with research that guides and challenges teachers' professional development and thoughts on this subject.

Prince (2000) found that in Aotearoa New Zealand the implementation of early childhood education for the environment was not widespread. This is surprising given that the principles of Te Whāriki He Whāriki Mātauranga mō ngā Mokopuna o Aotearoa Early Childhood Curriculum[2] (Ministry of Education, 1996) fit well with an environmental education focus. *Te Whāriki* is founded on the aspirations that children will "grow up as competent and confident learners and communicators, healthy in mind, body, and spirit, secure in their sense of belonging and in the knowledge that they make a valued contribution to society" (p. 9). When children experience an environment where they gain a sense of belonging and well-being, build relationships and are empowered, then they are able to be active agents of change in their environment. Nevertheless, in recent years there has been a greater focus and change in the field of ECEfS to recognise and include children's opinions and perspectives. Educators

[2] I will be referring to this document from this point forward as *Te Whāriki*.

enact a disposition of respect for children and their families[3] through developing a shared or agreed understanding between children and adults which involves co-construction of meaning and interpretations (Dockett & Perry, 2007; Ritchie, 2010a). This research fostered such respect as I gained understanding of children's perspectives on the role of guardian of the Earth. Further, this research makes a valuable contribution to the field by showing children's competence in taking action and being agents of change at a young age.

The overarching research question therefore addressed by this study is:

What are children's perspectives on their role as 'guardians of the Earth'?

This is supported by the following sub questions:

1. What are children's understandings about being 'guardians of the Earth'?
2. What are children's understandings about being 'agents of change'?
3. How do children co-construct and enact their understandings about these roles?
4. What importance do they give to these roles?

1.3 Overview of the Chapters

This thesis is organised into six chapters. In this first chapter, I identified the research topic, context, rationale, and the key questions that drive the research.

[3] From this point on when using the term family/families it encompasses the term whānau. This relates to family, extended family, parents and caregivers for the purpose of this research.

Chapter two is a description of the literature and past research that has informed and shaped this research. I also included the theoretical framework that underpins this study in this chapter.

Chapter three covers methodology. This chapter provides an outline of, and justification of, the methods, procedures and sources of data used in this research. Ethical issues, such as informed consent, anonymity, confidentiality and bias are also discussed.

Chapters four and five present the findings of the research. The findings highlight the themes that emerged from the data. Examples of data from research participants exemplify these themes.

Chapter six is the conclusion chapter. It restates the main findings and key arguments of the research. Finally the conclusion presents recommendations and implications that have transpired from this research. It also re-emphasises the importance of this research.

1.4 Summary

Early childhood is:

> …a period of momentous significance for all people growing up in [our] culture… By the time this period is over, children will have formed conceptions of themselves as social beings, as thinkers, and as language users, and they will have reached certain

> important decisions about their own abilities and their own worth. (Donaldson, Grieve, and Pratt, (1983), cited in Ministry of Education, 1996, p. 3)

And, dare I say, the worth of the environment. It is my opinion that the Earth is in trouble and 'UNLESS'[4] as the Once-ler puts it someone cares, nothing will change, it will not. This research places a spotlight on education that empowers young children to take action *in*, *about* and *for* the environment. The focus of this thesis is therefore, on the children's voices to gain their perspectives. In the chapter that follows, I will explore the literature, research and theory which have informed and shaped this thesis.

[4] Here I return to the Dr. Seuss quote that I started the chapter with.

Chapter 2: Literature Review and Theoretical Framework

"And deep in the Grickle-grass, some people say, if you look deep enough you can still see, today, where the Lorax once stood just as long as it could before somebody lifted the Lorax away."

~Dr. Seuss[5]

2.1 Introduction

This literature review explores the literature and past research on education for sustainability (EfS). The aim is to investigate the multiple complexities within the 'Grickle-grass' that is EfS in relation to early childhood education and young children's participation in research. Included is a brief historical perspective of EfS, an examination of the key ideas of EfS, including consideration of the trends in EfS from an early childhood education perspective.

The notion of sustainability is debatably one of the most serious issues of our time. It encompasses natural, social, economic, cultural and political dimensions (Kelly & White, 2013). When examining EfS, one cannot ignore the situational factors and evidence of overlapping social and environmental crises within the literature and the responses to the crises expressed in the literature.

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) declared a United Nations Decade of Education for Sustainable Development from 2005-2014, with a

[5] From *'The Lorax'* (Seuss, 2006, p. 2)

goal to strengthen formal, informal, and non-formal education and learning processes for sustainability (UNESCO 2007, cited in Engdahl & Rabušicová, 2011). This thesis was developed at the end of this decade and in response to an intense period of social and environmental change that shows no signs of abating.

In a report published by the Intergovernmental Panel on Climate Change (IPCC) on impacts, adaption and climate change (IPCC, 2007) a working group highlighted the risk to many social, biological and geographical systems due to climate change. This is also affirmed by the 2014 Climate Change Synthesis Report (IPCC) which stated that "In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans" (p. 6). Intersecting global, national and local contexts, climate change and the worldwide economic downturn are generating widespread concern and impacting on the lives of children in the 21st century. Hicks (2007) reflects on this situation and asked "how can and should education respond to world events in the early twenty first century?" (p. 3). Hicks (2007) continues to say that we cannot fully understand our lives in our own communities unless we position them within the wider global context:

> Every global issue has a local impact, though its form may vary from place to place-local and global have become two sides of the same coin. Education thus has a role to play in helping create citizens who can think and act globally as well as locally. This is no easy task for at heart it is about how we help young people understand their interconnectedness with others …(p. 4)

I agree with Hicks, and to not do so, would be an educational crime for the result is to disempower children rather than empower them to take part in responsible action for change. While it is difficult to grasp the challenges of our times, Hayward (2012) argues that

education must try to respond to the intricate interactions that are taking place in the environment the children inhabit, if it is to remain relevant. Well documented concerns in international reports on climate change and the well-being and continued development of human society (Flint & Taylor, 2007; IPCC, 2007; Stern, 2006; UNEP, 2009) has led the 'Club of Rome'[6] (2008) to conclude:

> The world has entered a period in which the scale, complexity and speed of change caused by human activities threatens the fragile environmental and ecological systems of the planet on which we depend.

These issues are important for educators to consider in preparing children for the world that they are growing up in and will inherit. From an early childhood perspective, Sue Elliott (2010), a leading early childhood environmental educator has suggested that, "It is becoming clearer that living sustainably is essential, not optional. There is no negotiation, education for sustainability is critical" (p. 34). To understand the interconnectedness of sustainability, teaching and learning, identity and transference along with the current thinking of EfS, I firstly consider the definition of EfS, followed by the historical context and theoretical perspectives that underpin this research.

[6] The Club of Rome was founded in 1968 as an informal association of independent leading personalities from politics, business and science, men and women who are long-term thinkers interested in contributing in a systemic, interdisciplinary and holistic manner to a better world. The Club of Rome members share a common concern for the future of humanity and the planet.

2.2 Defining Education for Sustainability

Sustainability means different things to different people, different cultures and in different situations. It is interpreted in many ways, and is highly contested. It is clear from the literature that defining sustainability, and therefore what it means to educate for sustainability, is challenging. Davis (2010b), a prominent researcher in early childhood education and sustainability agrees, stating that, "Sustainability is a confused and contentious topic that has no universally accepted terminology or definition" (p. 2). Sustainability raises questions about justice, rights, responsibility and caring for human beings and the world (Hägglund & Johansson, 2014). However, sustainability is not a new idea. Gibson, Hassan, Holtz, James, and Whitelaw (2005) describes it as "an old wisdom, perhaps *the* old wisdom" (p. 39, emphasis added). As they state:

> For most people in most human communities since the dawn of time, the main earthly objective was to continue. And the core strategy was to stick with what worked, which meant maintaining the traditional practices that ensured viable relations with nature and other people and the realm spirits, gods, or God. (ibid, p. 40)

This old wisdom can be compared to indigenous perspectives and approaches to nature.

2.2.1 Māori Perspectives

Māori, as the indigenous culture in Aotearoa New Zealand approaches to nature, sustainability and conservation, are filled with moral and ethical principles of accountability (Ritchie, 2014). Respect for nature is synonymous with care and nurture in this sphere,

similar to indigenous approaches throughout the world. A lack of care in Western society according to Suzuki (2010) is evident in practices such as harvesting of land for personal gain, which marks the origin of the current ecological crisis. In much of the nature-based ECE literature that exists in Aotearoa New Zealand beliefs such as these are evident in consistent references to 'ethic of care' (Noddings, 2007; Ritchie, 2010b) or within the notion of spirituality (Ryder, 2007). *Te Whāriki* (Ministry of Education, 1996) recognises as foundational Te Tiriti o Waitangi,[7] and supports indigenous Māori cultural practices and beliefs about the Earth. Among these is "the need to live as closely as possible with nature, to learn about it, to understand it" (Pere, 1991, p. 9). Māori, like many indigenous cultures, see nature as a critical source of energy, something that can stimulate imagination and develop creativity.

Traditional and contemporary indigenous views of sustainability are strengthened by a relationship with the land and the protective nature of engagement that is necessary for its long-term survival (Ritchie, Duhn, Rau, & Craw, 2010). Māori views of nature are enshrined in the concept of *whenua*, which can be understood as both land and placenta. Pere (1991) explains "whenua offers one the same feeling of warmth, security, nourishment and sustenance; a feeling of belonging" (p. 22). Therefore the natural environment sustains the individual, and mauri being the life force in every living thing, and gives sustenance. Every living thing, including inanimate objects like trees and rivers, is believed to have a spirit or mauri, a life force. Narratives too are highly significant, often telling stories of heroic

[7] The Treaty of Waitangi (Te Tiriti o Waitangi) is New Zealand's founding document signed in 1840 by representatives from Māori tribes and representatives from the British Crown. The Treaty is an exchange of promises between Māori and Pakeha (non-Māori), hence, the importance of a bicultural approach to policies and practices in education.

ancestors. They are commonly steeped in personal interpretations of actual events to make sense of phenomenon in the environment (Pere, 1998).

Indigenous approaches to learning also connect heart, hand and head and are deeply concerned with place. Mika (2011) advises that the Māori term whakapapa means action, or to act for (whaka), towards the living Earth (papa) through encounter. Ritchie (2010b) adds that this "world-view is embedded within an ethic of care that is underpinned by notions of aroha, whānaungatanga and wairuatanga simply explained as love, kinship and spiritual connectedness" (p. 11). Wairuatanga refers to the spiritual dimension. A sense of spiritual interconnectedness can be seen here in the following statement from the Waitangi Tribunal (2004): "Flowing from the oneness of the spiritual and physical world and the indivisibility of the natural world (including people as part of the world, not masters of it), there is a mutuality in the relationship between people and land" (p. 8).

These concepts, put together, provoke an action of care and concern that is shared by all within the community. This Māori belief system is aligned with indigenous perspectives from across the world. Davis (1993) explains the sacred meanings embedded in social relations with nature:

> This close attachment to the land and the environment is the defining characteristic of indigenous peoples: it is what links together, in a philosophical and cosmological sense, numerous geographically disparate and culturally diverse peoples throughout the world. (p. x)

Leopold (1949,1987), a pioneer environmentalist argued that because we regard the land as a commodity that belongs to us, we abuse it, where if we see the land as a community to which we belong we may begin to use it with love and respect. This view of the land as a community rather than a product reflects indigenous views and resonates with this research.

2.2.2 *Thinking on Sustainability*

Noteworthy differences between older and newer ideas of sustainability have been acknowledged in the literature. By outlining the theoretical journey of sustainability Cheney, Nheu, and Vecellio (2004) realised that the literal meaning emphasises permanence while the term as commonly used today emphasises the threat of ecological harm. Gibson et al. (2005) gathered that the 'old wisdom' focuses on the maintenance of practices that functioned at local and traditional levels, while new ideas are intent upon changing practices that do not work at the global level. In Aotearoa New Zealand, the Parliamentary Commissioner for the Environment (Williams, 2004) stated that "education for sustainability is still developing as a body of thinking. It draws on many theories and ideas from education and sustainability discussion" (p. 42).

A possible definition for EfS was suggested by Littledyke, Taylor, and Eames (2009) when they stated that, "Education for sustainability addresses the complex set of factors that interplay between social, environmental and economic conditions that make up the world we live in" (p. 4). Similarly Davis (2010b) stated "sustainability emphasises the linkages and interdependences of the social, political, environmental and economic dimensions of human capabilities" (p. 2). Elliott (2010) identified a more philosophical definition that, "education

for sustainability is about questioning the way we live, the impacts we create as a unique part of Earth's systems, and about creatively thinking of ways to live more lightly on the Earth" (p. 1). A future focus or future component has also been identified within the EfS literature. Tilbury (1995) identified the need for moving forward and explored the future dimensions of EfS. She described the future dimension as incorporating the "concept of 'empowerment' and 'action'" (p. 207). Like Davis (2010b), Tilbury (1995) highlighted that children consider the benefit and possibility of a greener economic, social and political society through environmental education for sustainability. This interconnectedness between the dimensions of sustainability was an important consideration for this research.

It is clear that the literature is strongly advocating that EfS is not optional. The review of the literature identified a number of definitions for EfS. The motivation is clear that EfS needs to connect the environment with the social, political and economic realms, with a future focus dimension.

2.3 History of Education for Sustainability

The concept of sustainability, as disputed as it is, is central to the notion of 'sustainable development'. The idea surfaced in the 1970's when there were growing concerns globally over environmental issues, which in turn gave rise to an environmental education approach (Gibson et al., 2005; Tilbury, 1995). The field of environmental education came to international attention at this time through a series of United Nations based international

meetings and declarations that have guided the course of environmental education since.[8] The Stockholm Declaration of 1972 identified the "… need for a common outlook and for common principles to inspire and guide peoples of the world in the preservation and enhancement of the human environment" (p. 1). Commissioned by the United Nations to develop a 'global agenda for change', the World Commission on Environment and Development (WCED) produced an influential report entitled *Our Common Future* (1987), also named 'The Brundtland Report'. In this report 'sustainable development' was defined as "…development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 8). The mantra 'Enough for all, forever' is also frequently used (Queensland Goverment Department of Education, 2008).

Sustainable development is formulated as a process of change that involves international cooperation, influential political action, vast campaigns of education, debate and public participation. The 'creative ambiguity' of the term sustainable development gives it wide significance (Kates, Parris, & Leiserowitz, 2005), and seen to be plausible for an outcome of international diplomacy (Gibson et al., 2005). In seeking to further explain and operationalise the new concept, a range of operational definitions, models, and indicators for assessing and reporting on sustainable development projects have been developed over the years.[9]

[8] Examples include the Belgrade Charter 1975 which comprises a framework of guiding principles and the Tbilisi Declaration 1977 established objectives, characteristics and role of Environmental Education (Chapman & Eames, 2007).

[9] Examples include: 'Triple Bottom Line' (Elkington, 2004) criticised for taking the economy as the primary focus point; 'Quadruple Bottom Line' or 'Four Pillars' which added the element of culture, the 'egg of sustainability' which represents the relationship between people and ecosystems (International Union for the Conservation of Nature, 1994); 'Pyramid Model' (AtKisson, 1996) and 'Amoeba Model' (AtKisson, 1991).

It can be argued that in spite of, and because of the attempts to define sustainability in an operational sense, controversy grew. Fien and Tilbury (2002) thought that the ambiguity of 'sustainable development' is confusing for teachers and leads to delays in changes that are necessary for a more sustainable society. Tilbury (1995) examined the transition of 'environmental education' to 'environmental education for sustainability', and questioned the differences related to these concepts. Tilbury found that the notion of 'sustainability' first appeared in the 1980's and went on to explain the term 'sustainability' was being used in environmental education in the 1990's. Although Tilbury does offer some insight into the history of environmental education, it can be argued that it lacks a global perspective as much of the data and ideas are drawn from British studies. Documents such as the *Tbilisi Declaration*, the *Brundtland Report* and *Agenda 21* are viewed as key documents in the development of education for sustainability. Significant ideas from these documents incorporate thinking around the interconnectedness of the social, environmental and economic dimensions, with a future focus for sustainability moving forward.

The main ideas drawn from these key documents that are relevant to this thesis, and that may contribute to the current understanding of EfS were:

- the reorientation of environmental education towards sustainability;
- the achievement of environmental awareness in all sectors of society;
- the integration of environmental concepts into educational programmes;
- the development of innovative teaching methods for educational settings; and
- enabling every person with the opportunity to acquire knowledge and skills to protect the environment (Cowie & Eames, 2004; Tilbury, 1995; UNCED, 1992; Williams, 2004).

A study by Henderson and Tilbury (2004) examined worldwide initiatives and approaches to sustainability and found that these documented commitments "have advocated for education reform or reorientation to reflect the new sustainability agenda" (p. 16). Education for sustainable development, as characterised by the United Nations' mandate, supports and fosters co-operation in international law, international security, economic development, social progress, human rights, and the achievement of world peace (UNESCO, 2014a). While the concept first appeared in the 1980's, it gained political importance in 2002 when the United Nations General Assembly approved education for sustainable development as a focus for the decade 2005-2014. At the launch of the United Nations Decade of Education for Sustainable Development (UNDESD), the then Director-General of the UNESCO, explained that education for sustainable development supports a major shift in human perception, behaviour, and interaction:

> Education for sustainable development, of course, must be more than just a logo or a slogan. It must be a concrete reality for all of us - individuals, organisations, governments - in all of our daily decisions and actions, so as to promise a sustainable planet and a safer world to our children, our grandchildren and their descendants. (Matsuura, 2006, p. 3)

The literature shows an international commitment to EfS and further highlighted the basis for this thesis.

Similarly, in Aotearoa New Zealand, in *See Change: Learning and Education for Sustainability*, a report written by the New Zealand Parliamentary Commissioner for the Environment (2004), this shift and momentum of the notion of sustainability over the 1990's

is also identified. The Commissioner acknowledged that education is, "essential for environmental sustainability and to sustain the social, cultural and economic well-being of people living now and in the future" (p. 37). The response to this has seen several local initiatives for EfS. Williams (2004) is of the view that local government agencies have played a key role in the development of sustainability education. Littledyke et al. (2009) identified one of these initiatives; education for sustainability in the primary curriculum, where they stated that, "More recently, the [Education] Ministry's Statement of Intent 2007-2012 has identified sustainable development as a key focus for education in New Zealand" (p. 2).

Aotearoa New Zealand has seen more than forty years of education for the environment. Bolstad (2003) identified that globally, environmental education is imperative and that a number of schools were orientating towards sustainability. Bolstad (2003) argued that within the Aotearoa New Zealand context environmental education had yet to become accepted as a part of teaching and learning, and required integration within the school curriculum. In 2007 the New Zealand Curriculum (Ministry of Education) reflected EfS notions within the curriculum vision in relation to children needing to be actively involved, connected and lifelong learners. EfS notions are also reflected in the principles of community engagement and future focus (Ministry of Education, 2007). From an early childhood perspective, Duhn, Bachmann, and Harris (2010) agreed with Bolstad's (2003) opinion, when they stated, "Internationally, education in general, and early childhood education in particular, has been slow to engage with global change" (p. 1). It can be argued that the pace is gaining momentum as several authors are examining both EfS and early childhood education for sustainability (ECEfS) within Aotearoa New Zealand and Australia (Cowie & Eames, 2004; Davis, 2010b; Elliott, 2010; Ritchie, 2013b; Vaealiki & Mackey, 2008). Cowie and Eames (2004) identified that, "since the early 1990's a number of developments have been made in

environmental policy, curriculum, and support, all of which have created opportunities for Aotearoa New Zealand schools to develop their own environmental teaching and learning programmes" (p. 180). Within Aotearoa New Zealand, one such initiative is the Enviroschools Programme which was developed in Hamilton in the late 1990's.

2.3.1 The Enviroschools Foundation

Initiated in Hamilton, this local government programme went nationwide in 2001. With the support of local government partners in each region, the foundation aims to create sustainable schools and communities and to promote learning and action for sustainability via the provision of appropriate resources and facilitation support. Originally designed for the primary sector, it is now being implemented nationally in intermediate schools, secondary schools, kura and early childhood centres. According to the Enviroschools Foundation website (2015), a third of all Aotearoa New Zealand schools are currently part of the network, and the foundation is approaching 1000 Enviroschools.

The programme promotes a whole school approach to sustainability and places on the programme are increasingly in demand (Chapman & Eames, 2007). The aim of the Enviroschools programme is to empower and enable individuals, families and schools to work together to create healthy, peaceful and sustainable communities. Building strong connections and trusting relationships is at the heart of this, as is fostering a culture of creativity and sharing (Enviroschools Foundation, 2005). The programme is guided by five principles which are:

- empowered students
- learning for sustainability
- Māori perspectives
- respect for diversity of people, and
- cultures and sustainable communities.

In a 2010 report on the Enviroschools Programme to the Ministry of Education, it was identified that the goals and objectives of the programme align with government messages and the embraced direction for school-based EfS, and with international and Aotearoa New Zealand/ Māori conceptions of sustainability (Eames, Robers, Cooper, and Hipkins, 2010). Enviroschools is strongly directed at a national level and well-led and supported at a local/school level. Eames et al. (2010) state that the programme has had an impact on school programmes and environments, and on teacher knowledge and pedagogy. Sustainability is the motivation behind Enviroschools (Eames et al., 2010) and other EfS programmes and experiences happening in education settings (Davis, 2010b).

In early childhood education, where we recognise the environment as the 'third teacher' (Malaguzzi, 1998) sustainability and related practices are becoming progressively more common. Sustainability is a challenged concept with a unique, yet not straightforward, relationship with nature based education and experiential learning (Dahlbeck, 2012). The EfS field draws from a series of covering domains of influence including education, philosophy and environmental studies (Arlemalm-Hagser & Sandberg, 2011; Dryzek, 2005; Littledyke et al., 2009) together with influential, well documented, international initiatives. Enviroschools kaupapa is consistent with the ethics of "caring, listening, participating and

hopefulness", described by Robinson and Vaealiki (2010) as a key tenet of ECEfS (p. 154). This kaupapa is an important consideration in the current research.

2.4 Concepts of Education for Sustainability

Education for sustainability focuses on the interactions between people and this requires a deep understanding of ourselves, each other, our societal and cultural processes, and how we are connected with the ecological systems of life (Davis, 2010b) . As Davis states, "it is founded on principles of critical enquiry, empowerment, participation, democratic decision making and the taking of action that supports sustainable living and aims for social change - it is transformative education" (p. 9). The ideas within education for sustainability connect with the terms commonly used by early childhood educators such as; holistic, authentic, meaningful, social, creative, critical thinking and inquiry. Similarly, Elliott (2010) identified that early childhood education has a pedagogical advantage to EfS because the mentioned pedagogical elements are fundamental to early childhood education. Therefore, it would make sense that young children are engaged in EfS in the early years. Davis (2010b) agrees, arguing that, "the value of starting early with education for sustainability is becoming much clearer, even if the practice and research is yet to fully emerge" (p. 228). This also emphasises the multiple complexities of EfS and identifies the lack of current research in EfS in early childhood education.

Several authors categorised environmental education as a threefold approach, identified as education *in*, *about* and *for* the environment (Barker & Rogers, 2004; Cowie & Eames, 2004; Davis, 2010b; McLean, 2003; Tilbury, 1995). The Ministry of Education (1999) proposed

that education *in* the environment allows for first hand experiences, education *about* the environment is knowledge that is taught about the environment, and education *for* the environment investigates a more in-depth level of environmental education which concludes in thinking and action of change *for* the environment. The above authors along with Bolstad (2003) have argued that the dimensions of education *in* and *about* the environment, which dominate our education system in Aotearoa New Zealand, are inadequate to effect change or to have an effect on children's attitudes and behaviours.

Although education programmes that employ the education *in* and *about* dimensions are worthwhile, they are not robust enough to sustain action and change. As Davis (2010b) suggests, "learning in and about the environment is not sufficient for laying the foundations of sustainable living" (p. 31). Davis goes on to identify that just learning *in* and *about* the environment lacks the human-environment exchanges and recognition of the significant problems. Yet claims have been made that educational experiences have positive benefits for children and their life-long learning, increasing a sense of rhythm, social skills, and the recuperative potential such engagement can provide in relation to health, well-being (Chawla, 2006; Cornell, 1998; Kelly & White, 2013; Littledyke et al., 2009; Wells & Lekies, 2006), and 'nature deficit disorder' (Louv, 2008).

Similar claims are also made from an indigenous perspective, where a 'personified' view of nature as nurturer and sustainer of life is posed (Ritchie, 2011) with an associated ethic of care (Noddings, 2005). A number of writers have linked an awareness of nature with respect and care for the environment. Plotkin (2008) argues that this awareness and subsequent care are attainable through play for the young child. These concepts do set the scene for an

Aotearoa New Zealand approach to education that draws on experimental learning as a basis of bicultural, nature-based education. A recent study in Aotearoa New Zealand explored nature-based education and found that:

> Learning within ECE settings and beyond the gate within this approach signals implicit connections with children's natural, social and cultural worlds through these relationships. Engagement with places, therefore, has the potential to build learning power and learner identity through empowerment and holistic development that is central to Aotearoa New Zealand ECE curriculum. (Kelly & White, 2013, p. 15)

In comparison, education *for* the environment is based on people taking an active role and advocates for work from an inquiry base, or as Davis (2010b) stated, "the form of EE [Environmental Education] adds the social-political dimension" (p. 31). Tilbury (1995) goes on to suggest that this dimension allows for a sense of responsibility and active participation by children. The term 'enactment' resulted from this field and allows for critical reflection and change. Unfortunately, examples within the education sector of research *for* the environment are limited, particularly in early childhood education. There are several reasons cited for this phenomenon, not least the perceived newness of ECE and 'Education for Sustainability' under the broader framework of ECEfS (Davis et al., 2009). Bolstad (2003), supported by Cowie and Eames (2004) and McLean (2003), suggests that this deficiency could possibly be because this dimension of education *for* the environment has been acknowledged as more challenging for teachers. However, all the reviewed literature strongly suggests the concept of education *for* the environment as the foundation for future learning and the development of EfS, including ECEfS programmes. ECEfS is an approach to learning that promotes ecological awareness through engagement with nature (Duhn et al., 2010).

A suggested notion to guide education for sustainability is that of action competence. Jensen and Schnack (1997) suggest that, "the concept of action competence includes the capacity to be able to act, now and in the future, and to be responsible for one's actions" (p. 175). Mogenson and Schnack (2010) adds a sociocultural dimension to action competence concepts which is less individualistic but a collaborative action and an educational ideal. Jensen and Schnack (1997) go on to categorise action competence into four aspects; knowledge/insight, commitment, vision, and action experience. Eames et al. (2006) agree, but adds connectedness and reflection to these aspects. Being competent, according to Jensen and Schnack (1997), is connected with being able and willing, as well as being a qualified participant. These authors go on to highlight the value of learning through experience, clarifying what action taking is in relation to action competence and how these ideas could be applied to early childhood education. These are all useful aspects for this thesis. Equally, Vaealiki and Mackey (2008), in a study on strengthening environmental competence in an early childhood centre, concluded that their study may encourage teachers to notice the many ways that young children can advocate for environmental issues. They also suggest a focus on aspects of action competence within ECEfS.

Education for sustainability is a recent curriculum and programme area in early childhood education. Within the domain of early childhood education, the idea of children being ready, willing and able has been defined as learning dispositions, also known as habits of mind, or tendencies (Claxton, 2009). Along with Margaret Carr, a prominent early childhood researcher in Aotearoa New Zealand, Claxton argued that education for the 21st century should have the intention of developing young people's ability to be confident and skillful when facing complex predicaments (Claxton & Carr, 2004). Being ready, willing and able is described by Claxton and Carr (2004) as learning inclinations, sensitivity to occasion and

skills. Therefore there is a detectable link between action competence and learning dispositions. This concept of dispositional learning is infused within *Te Whāriki* (Ministry of Education, 1996). The children's dispositional learning towards sustainability was of particular relevance for this research. The literature reveals a strong connection between learning dispositions, EfS and early childhood education.

2.5 Concepts of Early Childhood Education for Sustainability

There are clear synergies between EfS and early childhood education (ECE) in Aotearoa New Zealand. Internationally, Aotearoa New Zealand is known for being a clean green country with cultural connections to the natural world, and where teachers, children, and families have easy access to the natural world. While early childhood educators have traditionally given children experiences with nature (Duhn et al., 2010; Enviroschools, 2015; Vaealiki & Mackey, 2008), grounded in the ideologies of philosophers Froebel, Rousseau and Pestalozzi, early childhood education for sustainability is now seen as more than just being in the natural world. Programmes are guided by the early childhood curriculum, *Te Whāriki* (Ministry of Education, 1996), a holistic, bicultural document that interweaves the principles of well-being (mana atua), holistic development (kotahitanga), empowerment (whakamana) and belonging (mana whenua).

The holistic, authentic nature of *Te Whāriki* (Ministry of Education, 1996) supports and encourages early childhood teachers to delve into the rich world of EfS. The United Nations Decade of Education for Sustainable Development (2005-2014) challenges teachers and teacher educators to reflect on the contribution education can make to a sustainable future

(UNESCO, 2005). Samuelsson and Kaga (2008) along with Davis (2010b) both suggest that ECE is the significant institutional site, beyond family, where life-long learning starts. They argue that basic values, attitudes, skills, behaviours and habits about nature developed in the early years can last a lifetime. Fien (2003) adds that an awareness of our connection with, and in the world, and an attitude of caring are required. The goal of the dedicated United Nations Decade of Sustainable Development (2005-2014), and the education connected with it, was the creation of a "better world for this generation and future generations of all living things on planet Earth" (UNESCO, 2005).

There is widespread agreement that environmental education and EfS should begin in early childhood; the starting point for lifelong learning (Carson, 1956, 1998; Chawla, 2006; Davis et al., 2009). The literature calls to action all teachers to explore the wider community with young children, and rediscover the natural world. In the current ECE climate diverse issues such as values connected with learning in nature, legislative challenges in safety and risk, and concerns regarding the types of ECE environments now offered to very young children provide additional motivation for ECEfS. This motivation is coupled with attention to indigenous perspectives that place nature as a living entity and a curriculum that view children as confident and capable learners who encounter 'people, places and things' as learning potential (Littledyke & McCrea, 2009) within ECE.

Davis (2010b) identifies three essential underpinnings of ECEfS. Firstly, a broadly-based rights dimension that requires all children to be respected as a person in their own right, with these rights not just bounded to the present but also extended to healthy sustainable futures. Secondly, there is the child competency dimension, which recognises that young children

already have capacities and capabilities for shaping and creating their worlds, and have a right to be involved. As Lansdown (2004) states, "Listening is not enough - children have the right to have their views taken seriously" (p. 12). Children are always engaged in inquiry about their world and develop their own questions, ideas and theories as they make meaning of their experiences (Hedges, 2011). The last dimension is that of participatory and activist elements, which support environmentally mindful citizenship that helps young children to challenge unsustainable thinking and practices. This includes putting children's ideas into action: "...they are movers and shakers in their own right" (Penn, 2004, p. 20).

These underpinnings were of great importance for this research, as the focus was on children's perspectives on being guardians of the Earth. In this research, children were active participants and their views were taken seriously, to ensure a greater understanding of their views on what it means to be agents of change. Education for sustainability empowers children and societies by providing them with values and basic skills associated with sustainability (Engdahl & Rabušicová, 2011).

Samuelsson and Kaga (2008) agree and adds that the kind of early childhood education that will support a sustainable society should display four key tenets. Firstly, that the child is a right holder who actively participates and contributes to society's present and future. Children's perspectives and meanings are listened to, considered and shape the content and approaches of learning. Secondly, that early childhood education for sustainability is much more than environmental education. It includes opportunities for children to engage in intellectual dialogue regarding sustainability and will include learning for compassion, respect, equality and fairness. Thirdly, that diversity and democracy are key issues for

sustainability and that children acquire an identity, firmly grounded in the culture closest to them, while developing a sense of themselves as world citizens. Learning about democratic values and practices are a requisite for a just society where everyone's participation in the social, cultural, economic and political life is valued and counted. The fourth tenet is that ECEfS requires people to think critically about things that are taken for granted, and to find creative solutions and alternatives to unsustainable habits and practices. Such an approach falls within the guidelines of *Te Whāriki* (Ministry of Education, 1996).

Te Whāriki (Ministry of Education, 1996) stipulates that "The curriculum builds on what children bring to it and makes links with the everyday activities and special events of families, whānau, local communities, and cultures" (p. 42). The principles of *Te Whāriki*, especially the curriculum strand of 'Belonging' reinforces this emphasis on connection with families and community. The strand states that "Children and their families experience an environment where: connecting links with the family and the wider world are affirmed and extended" (p. 54). The strand 'Exploration,' provides the closest explicit reference to EfS and recognises the importance of connecting with nature. The exploration goal states that children are developing working theories about planet Earth, and developing geographical knowledge of places of local significance and the development of a relationship with the natural environment (Ministry of Education, 1996). Education for sustainability also includes the conscious fostering of a sense of community, which is viewed as being fundamental to building strong sustainability (Alvarez, 2007). This too is a key feature within the early childhood curriculum, *Te Whāriki* (Ministry of Education, 1996) that states:

> This curriculum emphasises the critical role of socially and culturally mediated learning and of reciprocal and responsive relationships for children with people,

> places, and things. Children learn through collaboration with adults and peers, through guided participation and observation of others, as well as through individual exploration and reflection. (p. 9)

Within this focus in the curriculum, there is the opportunity for children to explore their own environmental identity. Hardy (2006) describes an appreciation of the 'living' qualities of nature through the senses rather than exclusively through cognitive means as a dialogic process where human engagement with nature evokes a response and is characterised by surprise. According to Hardy (2006) nature can be seen to have many voices of its own. Teaching and learning in dialogue with nature therefore requires "active listening, humility and playfulness" (Hardy, 2006, p. 274). The development of children's 'naturalistic' intelligence, as characterised by a captivation with, and affinity to, the natural world and animals (Gardner, 1998) can be encouraged through the provision of playful learning experiences. These experiences connect children to the environment as a natural world through which they gain understanding and perspective.

In a text on ecological identity, Thomashow (1995) states that "ecological identity refers to all the different ways people construe themselves in relationship to the Earth as manifested in personality, values, actions and sense of self. Nature becomes an object of identification" (p. 3). Similarly, Clayton and Opotow (2003) propose another insight into environmental identity stating: "Environmental identity - how we orient ourselves to the natural world - leads us to personalize abstract global issues and take action (or not) according to our sense of who we are" (p. 2). Pelo (2013) offers the idea that ecological identity grows through the disposition of delight.

> Ecological identity is bound together with ecological literacy, which is, at its core, whole-hearted delight in and curiosity about and knowledge of the beyond-human world. Ecological literacy is anchored by core dispositions, habits of mind and heart that play out over time to become a person's essential ecological nature. (p. 46)

Children's right to play and have regular access to the culture, recreation and the arts are also enshrined in Article 31 of the United Nations Convention on the Rights of the Child (United Nations, 1989). 'Play' and 'nature' are fundamental tenets of early childhood education. Waters (2011) states that these "two ecological contexts help sustain healthy human beings" and argues that both these contexts are being "eroded from many children's lived experiences" (p. 251). This notion of ecological or environmental identity was useful for this thesis. I explored the children's understandings, connections and values they placed on guardianship and in the action they take around education for sustainability.

Early childhood education for sustainability also includes working on the need for global partnership and consideration for one another (Duhn et al., 2010). The development of some Western societies shows on one hand an increasing individualization and on the other hand an increasing globalization. Social democratic traditions exist hand in hand with a neoliberal economic practice. This tension between individuality and solidarity is inevitably part of the moral life in ECE (Elliott & Davis, 2009). It is within the early years that children exhibit the greatest ability to learn and develop. ECEfS has the ability to foster socio-environmental resilience based on interdependence and critical thinking, establishing foundations for lives characterized by self-respect, respect for others, and respect for the environment (Davis et al., 2009). Elliott's (2003) national review of Australia's environmental education in early childhood was called, "Patches of Green", specifically because only a few 'green patches' of

exemplary practice were found. A study by Price (2000) in Aotearoa New Zealand, and a study by Flogaitis, Daskolia and Liarakou (2005) in Greece supports this impression, in relation to their own countries' environmental education in early childhood. A longitudinal study from the UK showed that children by the age of four already have knowledge of their environment, and display simple but accurate understandings of the effects of environmental change and its bearing on different habitats and individuals (Palmer & Suggate, 2004).

Few researchers have studied and explored the relationship between early childhood education and education for sustainability within Aotearoa New Zealand. Vaealiki and Mackey (2008) are two of these early childhood education researchers who have woven a connection of EfS with *Te Whāriki* (Ministry of Education, 1996). They identify a key point in traditional thinking of environmental education, that it could be a more "transformative, collaborative approach" (Vaealiki & Mackey, 2008, p. 7). Vaealiki and Mackey (2008) go on to suggest that, "this [transformative] approach includes young children having a voice in how an environmental curriculum is enacted in the early childhood centre resonates with the philosophical underpinnings of *Te Whāriki*" (p. 2). In order to understand the transformative approach within the EfS context, Rathzel and Uzzell (2009) explain that the 'transformative' approach "signifies what we need to think about how to fundamentally change the social conditions which have led to environmental degradation" (p. 256). This reflects the aspects of education *for* the environment. Davis (2010b) explains education for the environment in an early childhood education perspective when she states that:

> While playing and learning in nature remains highly valued, this newer conceptualization refers to a transformative early childhood education that values, encourages and supports children as problem seekers, problem solvers and action-takers around sustainability issues and topics related to their own lives. (p. 230)

In Vaealiki and Mackey's (2008) three week study of an Aotearoa New Zealand kindergarten with an environmental focus, they found that environmental competency was like a ripple, strengthening with the momentum of shared responsibility. When the teachers and parents listened to the children's concerns about the environment and their ideas for sustainable practice, the children believed that they could be agents of positive change. The belief of being agents of change affected kindergarten and home practices and rippled through to the community.

Vaealiki and Mackey (2008) drew upon the sociocultural context of the early childhood setting and through this the children's thinking, questioning and contribution surfaced as the fundamental emphasis for the success of the environmental education focus. They identified that "children's thinking and questioning was a significant catalyst in encouraging teachers to increase the complexity of the environmental curriculum and extend specific subject knowledge and understanding about environmental actions" (p. 3). The findings from the above mentioned study appear to echo the view of Davis (2010) where children are viewed as problem solvers and action takers. This view of the child as being competent and capable is a strong underpinning of *Te Whāriki* (Ministry of Education, 1996). Vaealiki and Mackey (2008) reinforce the fit between early childhood education and EfS. Children are naturally curious and connected to the natural world while *Te Whāriki* (Ministry of Education, 1996) provides a bicultural curriculum that is flexible and responsive and has EfS woven throughout its principles and strands.

As mentioned earlier there is a shortage of research exploring EfS and early childhood education. Davis (2009) has revealed in her literature review of a twelve year period 1996-2007, that there was a small number of studies on young children's relationship with nature, fewer on children's understandings of the environment, and even less on children being agents of change for sustainability. Davis and Elliott (2014) state that:

> Only in more recent years has this latter line of research been explored, mostly by Australian-based authors … with the trend only now becoming more prevalent on a broader international scale … (p. 4)

Two studies that focused on education about the environment were Britsch's (2001) study of environmental literacy in non-narrative compositions of kindergarteners and Gest and Fraser's (2009) research on a nature-based inquiry project. Britsch (2001) discovered that even young children can express complex environmental understandings through drawing, symbols or letters, and dictated description. Gest and Fraser's (2009) case study findings showed that meaningful learning was not planned but was based on the emerging interests and questions of the children. The study found that the teacher's role was to be an active listener, repeating, rephrasing and revisiting children's queries and understandings. The other important finding was that learning was a collaborative effort and a sharing of expertise between children, teachers, parents, and community members. Prince's (2010) study highlights the need to make education for sustainability a visible and integral part of *Te Whāriki* (Ministry of Education, 1996).

Davis (2009) called for funding for exploratory research in educational settings, and proposed that research and researchers need support both conceptually and practically. Davis concludes that:

> Early childhood is a high leverage area with investments in young children having the potential to reap big rewards into the future. Research in early childhood education for sustainability will add to these investments. This is a field whose time has come. (p. 239)

Julie Davis clearly spells out the need for studies such as this one, where children's competencies in being agents of change are explored.

Five studies (Davis, 2005, 2008; Duhn et al., 2010; Norddahl, 2008; Vaealiki & Mackey, 2008) were identified that focus on early childhood education *for* sustainability, whereby children were agents of change and working sustainably. In these studies, researchers, teachers and parents collaborated to collect and analyse data through visual representation, observation, rich dialogue, surveys, photos, stories, and project notes. Norddahl's (2008) study again found that even very young children are competent learners who can understand and explore complex environmental problems, discuss and form critical opinions, and find their own clever and sustainable solutions. Duhn et al. (2010) identified that, in order to have a significant impact on climate change it is essential to act globally and to involve children in advocacy beyond the early childhood setting. The study found that global citizenship is about the commitment to justice and wellbeing of all, in the neighbourhood as well as on the global scale.

Davis' (2005, 2008) two Australian studies described the evolution of sustainable practices in much the same way as Vaealiki and Mackey (2008) and the 'ripple' effect - as having a butterfly effect in which small actions and wins magnified into large scale changes in the centre and outwards into the community. In these studies there is strong consensus about the ability of young children to understand, think critically about, and even take action on complex environmental issues. Duhn (2012) argued that if children are humanity's hope for the future, then this means that early childhood education should rethink childhood as a core aspect of creating eco-focused pedagogies.

Recently, there has been a greater focus on including children's perspectives and opinions in the field of ECEfS, which involves shared meaning making or co-construction of meaning and interpretation. This involves adults engaging respectfully with children and their families in order to develop a shared or agreed understanding (Dockett & Perry, 2007; Ritchie, 2010a).

Meaning making, as a pedagogical approach, relates to a democratic pedagogy in which children's own understandings and meanings are respected (Alexander, 2000). Shared understanding, or intersubjectivity, is important for rich and meaningful interaction, and for teachers to be able to understand the ways children are thinking (Tayler, 2001), a crucial point in relation to this study. Research shows that young children can be encouraged to express their viewpoint and this results in an increased capacity to acknowledge alternative views as equally valid (Bertram & Pascal, 2002). This research study approach sought to embrace children's rights under the United Nations Convention on the Rights of the Child (United Nations, 1989), and a deeper understanding of socio-cultural theory in practice;

"work that investigates the power relations between adults and children" (Peters & Kelly, 2011, p. 20).

2.6 Theoretical Frameworks

There are several theorists that have particularly influenced early childhood pedagogy in Aotearoa New Zealand, such as Vygotsky and Bronfenbrenner. Most useful for this research was Vygotsy's socio-cultural theory, yet Bronfenbrenner's ecological theory also supported my thinking and contributed to this thesis.

2.6.1 Socio-cultural Theory

Socio-cultural theory provided a broad theoretical framework for this thesis. It supported the methodological assumptions, the research design, and my position as a researcher. The socio-cultural approach focuses on interactions between community members. Socio-cultural theory suggests that looking at the world from the children's perspective is both useful and necessary in understanding these interactions and their impacts upon children. A socio-cultural perspective suggests that children do not invent all of their knowledge and understanding but they make use of the knowledge accumulated in their culture (Bedrova & Leong, 2007). Therefore, socio-cultural theory proposes that thinking and learning are culturally organised activities that are contextually situated and socially facilitated between different knowledgeable members of the culture (Wood, 2005).

In socio-cultural theory language and social interaction are encouraged along with problem solving, collaboration and co-operative learning. Russian psychologist Lev Vygotsky proposed a "socio-cultural learning theory" that emphasised the impact of social and cultural experiences on individual thinking and the development of mental processes.

Jenkins (2009) explored Vygotsky's work and claimed the theorist believed that "learning implied an active, student-centred process in which teachers took an interest in their students' ideas" (p.31). Professor Guy Claxton (2009) analysed Vygotsky's work, and concluded that it provided two useful contributions in this area. Firstly, "minds consist largely of internalised habits, strategies and attitudes that are first developed in interaction with other people, and which therefore substantially reflect their habits and values" (p. 180). The second insight is described as "whatever habits of mind you bring with you to learning, these are always selected, shaped and skewed by whatever unique predicament you happen to find yourself in" (Claxton, 2009, p. 180). Socio-cultural research show that thinking involves not only individual processes, but also interpersonal and community processes (Rogoff, 2003). It is easy to recognise further that thinking takes place in the context of the activity, and thinkers use tools such as language, actions and resources that support and influence their thinking (Fleer, Anning, & Cullen, 2004; Wells, 1999).

The ideas around socio-cultural theory, child centred learning, learning dispositions and the notion of working theories, have strong implications for education and for this study. The socio-cultural approach helped me find out more about how children experience their everyday lives. The children participated in a wide variety of joint activities, discussions and experiences at the kindergarten and beyond. This provided opportunities for insight into some

of the influences on the children's understanding and participation. The children engaged in roles, relationships and activities in relation to ECEfS. Discovering children's perspectives is vital for bridging the child-adult gap and the co-construction of shared understanding between adults and children in a place of learning (Harcourt & Einarsdottir, 2011). This highlights the need for research such as this one, where a focus on children's perspectives on guardianship (kaitiakitanga) serves as a key to help bridge this gap.

"Vygotsky provided us with an image of the 'collective child" (Faulkner & Woodhead, 2000, p. 27). Key ideas of socio-cultural theory are that higher order functions, such as problem solving, develop out of social interaction, and that child development cannot be understood by a study of the individual but must also examine the external social world in which that individual life has developed. Learning occurs within social events and when a child interacts with people, objects, and experiences in the environment (Burman, 2008). It is participation in social communities and cultural practices that provides the very materials out of which children construct who they are, give meaning to what they do and understand what is known (Yelland, 2010). Although current research has shown that within appropriate pedagogies young children have been shown to be important players in the changes needed for creating sustainable futures (Elliott & Davis, 2009; Mackey, 2012), a greater understanding of children's participation is still needed. This research contributed to these understandings by exploring how children perceive their role in caring for the Earth, and actions for the environment. Harcourt and Einarsdottir (2011) found that exploration through a social constructivist lens, shows that when children are treated as equals, they can take ownership, actively participate in every stage of the research process and be seen as expert informers and witnesses regarding their own experiences.

The notions from a socio-cultural theorist such as Vygotsky have also been allied to transformative education. Rathzel and Uzzell (2009) noted that, "Vygotsky's dialectical theory of development considers learning as requiring conflict-generated problem solving in which education provides opportunities for resolving dilemmas" (p. 271). EfS in itself, addresses issues, problems and dilemmas which require creative thinking, reflection, dialogue, and debate, but most of all action. Therefore, transformative education and EfS works well together. The New Zealand Parliamentary Commissioner of the Environment (2004) focused on critical thinking and reflective teaching and suggested that, "people need to reflect on their own learning. Education for sustainability encourages people to ask lots of questions, to challenge underlying assumptions, and to think themselves about sustainability issues, and critical thinking" (p. 44). Similarly, Julie Davis (2010a) proposed that creative solutions will need to be developed to conquer the challenges of the current environmental concerns. In order to develop this creativity, Davis argues that, "contemporary early childhood education places a strong emphasis on children constructing their ideas about the world" (p. 170). She identified the connection of the notion of children's 'working theories' with *Te Whāriki* (Ministry of Education, 1996), which states that children should be encouraged to "develop working theories for making sense of the natural, social and material worlds" (p. 82). Hedges and Jones (2012) describe working theories as theories that

> …are present from childhood to adulthood. They represent the tentative, evolving ideas and understandings formulated by children (and adults) as they participate in the life of their families, communities and cultures and engage with others to think, ponder, wonder and make sense of the world in order to participate more effectively within it. Working theories are the result of cognitive inquiry, developed as children theorize about the world and their experiences. They are also the ongoing means of future cognitive development, because children are able to use their existing (albeit

> limited) understandings to create a framework for making sense of new experiences and ideas. (p. 36)

Children's working theories can be challenged to extend, deepen and explore their thinking further, thus creating a working theory spiral. *Te Whāriki* suggests that children develop working theories through "observing, listening, doing, participating, discussing and representing within the topics and activities provided in the programme (Ministry of Education, 1996, p. 44). Farquhar (2003) *Best evidence synthesis* highlights participation in real and meaningful activities as a key strategy for improved outcomes.

Mutual engagement for enquiry in an interests-based curriculum is a common pedagogical model for early childhood (Hedges, 2007), and joint attention is an important pedagogical strategy (Siraj-Blatchford, 2004) that can support attentive awareness, thought and action in activity. Working theories are shaped and strengthened when children engage with others in thinking (Davis & Peters, 2010) and in particular, adults make a significant contribution to the modification and refinement of children's working theories (Hedges, 2007; Meade, 2000). Therefore it can be seen that the socio-cultural concepts aligns with both early childhood education and EfS. Socio-cultural theory and ecological theory are also complementary as both recognise the child as a capable social being that needs to be connected to others in society to develop.

2.6.2 Ecological Theory

The predominant belief of ecological theory is that having social relationships and supportive links between environments helps shape our learning (Bronfenbrenner, 1979). Within ecological theory, it is proposed that the environment effects what and how people learn. The theory is depicted by a series of macro and micro interacting ecological and social systems with the learner engaged with the learning environment at its core. As Bronfenbrenner (1979) said "the ecological environment is conceived as a set of nested structures… like a set of Russian dolls" (p. 3). Paquette and Ryan (2001) suggest, after analysing Bronfenbrenner's ecological systems theory that "changes or conflicts in any layer will ripple through other layers" (p. 1). If this is the case, children should be able to have ripple effects on all areas of the system through taking action and being involved in taking action for the environment. Bronfenbrenner's ecological theory is woven throughout *Te Whāriki* (Ministry of Education, 1996). In a reference to Bronfenbrenner's Ecology of Human Development, *Te Whāriki* identifies, "another aspect of this exchange between children and their environment is the influence of the communities to which children belong" (Ministry of Education, 1996, p. 19). Within this study, the reciprocal notion of the influences between children and their communities was an important consideration.

2.7 Summary

The literature review highlighted a number of key themes. It opened with an overview of social and environmental influences that impact on the lives of young children and considered the context and significance of education. The review explored the way that

education for sustainability is conceptualised in international and national literature as well as *Te Whāriki* (Ministry of Education, 1996).

The concept of sustainability and sustainable development were considered from a range of perspectives. As this research coincided with the conclusion of the United Nations Decade of Education for Sustainable Development, EfS was a major focus for this study. The literature shows that education for sustainability or education for sustainable development is interpreted in different ways, and is a poorly defined, ambiguous notion. The findings in the reviewed literature can be viewed in different ways (depending on the lens – political, social, environmental, economic or cultural). This ambiguity arguably confuses teachers therefore leads to delays in the changes necessary for a more sustainable society (Fien & Tilbury, 2002).

The small yet growing amount of current literature relating to early childhood education and education for sustainability was highlighted. The earlier 'hole' in the literature has proved challenging. Consequently, the review examined available publications individually, making links where possible and obtaining literature from other education sectors. Some positive examples of EfS pedagogy and practice in early childhood were found in resent research articles relating to early childhood education and EfS within Aotearoa New Zealand and Australia. These articles suggests movement away from traditional thinking of environmental education to a more transformative approach to EfS. This transformative approach would in turn create opportunities to link to education *for* the environment. Other ideas include viewing the child as a competent, capable problem solvers who explores the world through their working theories, effecting change in one context that ripples across to other contexts.

An example of this is the idea of the child conveying prior knowledge propagated from the early childhood centre and sharing this at home.

From the literature it is clear that more needs to be done to explore the moments of 'UNLESS' for young children and the intricacy of the 'Grickle-grass' that is EfS. This literature review examined literature in order to contextualize this study, which investigated the multiple complexities of EfS by exploring young children's perspectives on their role as guardians of the Earth using a socio-cultural theoretical perspective on children's learning. How this research was conducted is discussed in the next chapter.

Chapter 3: Methodology

"On the end of a rope he lets down a tin pail and you have to toss in fifteen pence and a nail and the shell of a great-great-great-grandfather snail. Then he pulls up the pail, makes a most careful count to see if you've paid him the proper amount."

~ Dr. Seuss[10]

3.1 Introduction

The purpose of this chapter is to describe the design of the study, including the methodology, setting, participants and data collection. Varied data were gathered for this study. Treasures such as the once-ler's fifteen pence, a nail, and a shell of a great-great-great-grandfather snail were amongst the study 'finds'. Specific decisions were made to ensure a careful count of the proper amount of data and analysis to ensure transparency and trustworthiness.

This chapter begins with an outline of the qualitative methodology. Following this the case study approach, selection and setting of the research is discussed, and the participants are introduced. Data collection methods are discussed, and ethical considerations, such as informed consent, anonymity and confidentiality, are addressed.

[10] From *'The Lorax'* (Seuss, 2006, p. 58)

3.2 Research Design

The research methodology needs to suit the purpose of the study and it is therefore a key part of the research design. When choosing a methodology, significant thought is given to the most appropriate way to answer the research questions. The aim of this research was twofold; to understand the children's views and values in respect of being guardians of the Earth; and to investigate what might lead to their understandings and actions to gain support for ECEfS pedagogy.

A fluid method was true for this study rather than the simple cyclical model. A research process was developed that respected the rights of children and families, through a flexible evolving design that provided a range of ways for them to participate (Clark, 2005a; Mackey & Vaealiki, 2011; Te One, 2007). The children could opt in and out of the research on a daily or even play event basis as they participated in the kindergarten programme. Analysis of the data took place while collecting data, which in turn resulted in more data collection and interpretations, depending on the children's involvement and discussion or information gained from children's families.

Cohen, Manion and Morrison (2007) indicate that research design is governed by the notion of 'fitness for purpose'. For this research, a qualitative methodology within an interpretive paradigm was selected. Its associated characteristics make this framework fit for this purpose. These characteristics include a naturalistic approach, the researcher as key instrument, descriptive data, meaning, an interpretive approach, a participatory approach and case study.

3.2.1 A Naturalistic Approach

A significant strength of qualitative research is that it is naturalistic. This means that qualitative research is more likely to be conducted within a natural setting sensitive to the people and places under study (Creswell, 2013). It is more likely that natural behaviour will be observed in a natural setting, because situation has an effect on behaviour. Bearing this in mind, I conducted this study in the kindergarten I teach in, which is one of the 'natural settings' the children I teach and who participate in this study are familiar with. This allowed me to gather rich data through interacting directly with the children and their families, and seeing them behave and act within a familiar context. It is unlikely I would have gained rich data had the children and their families been in an unfamiliar context.

3.2.2 Researcher as Key Instrument

The qualitative researcher collects data through observing behaviour, examining documents, collecting samples of work, and interviewing participants. The researcher may use an instrument to collect data, but it is the researcher who actually gathers the information for the study (Creswell, 2013). Therefore, when children are involved in a study, extra care needs to be taken towards building a researcher-participant relationship of trust and respect. This study took the approach from the children's rights and childhood studies paradigms to ensure a study of childhood in a more contextualized way – by 'looking up' (Mayall, 2002, cited in Smith, 2007). This involves trying to understand the children's standpoints in the context of their own lives, and treating them as actors and knowers. Harcourt and Conroy (2011) state

"If researchers want to work *with* children rather than *on* children, it is critical that time is dedicated to establishing a research relationship with children" (p. 41). Grover (2004) also noted the importance of establishing trusting relationships to overcome the predisposition of children to respond to adults with a 'right answer'. Being a teacher at the kindergarten was therefore an advantage; I already had a rapport with the children, and did not enter the research field as a stranger. Furthermore, I had already established relationships, familiarity and trust with the children and their families. For the purpose of this study, a continued trusting relationship with the children and their families in this context was a key aspect to understanding the children's views and perspectives on being guardians of the Earth.

3.2.3 Case Study

A case study approach was selected for this research for several reasons. Firstly, case study research compliments an interpretive approach (Cohen, Manion, & Morrison, 2000). Secondly, according to Merriam (1998), case study research has shown to be particularly useful for studying educational innovations, for evaluating programmes and for advising policy. Thirdly, case studies investigate and report on the complex dynamic and unfolding interactions of events, relationships and other factors within a unique context (Cohen et al., 2000). All three of these reasons connected to the focus of the study, exploring ECEfS, as well as gaining the participants' perspectives on being guardians of the Earth. Lastly, the need for case study typically arises out of the want to understand a complex social phenomenon (Yin, 2009). ECEfS and understanding children's perspectives are both very complex topics.

Yin (2009) discusses a case study as the detailed examination of one setting. There were two main reasons for choosing my kindergarten as the setting for this study. Firstly, this kindergarten has been implementing a programme with an education for sustainability curriculum focus, and has done so for the last ten years through the Aotearoa New Zealand wide Enviroschools programme. I felt this was an important contextual aspect for this study, because of the focus on ECEfS. Secondly, as already indicated, I had existing relationships and a rapport with the research participants. Both factors were crucial in gaining the children's voices and understandings of what they felt were important and how they valued the environment.

Like Yin (2009), Merriam (1998) defines case study as a comprehensive examination of one setting or a single subject. Cohen et al. (2000), proposes that the point of case study is to portray, analyse and interpret the uniqueness of real individuals and situations through accessible accounts. In this research it is the children who are the real individuals within their real context. It is their experiences of an education for sustainability programme that forms the 'case'.

3.2.4 Descriptive Data

In qualitative research the data comprises rich, narrative descriptions which are used to understand what is occurring and why, rather than to prove a point. Rich descriptive data can be collected through seeking to understand individual's perceptions of the world by uncovering the socially constructed meanings of participants (Bogdan & Biklen, 2007; Mutch, 2005). This research was not about a chance to extract one 'truth' but rather an

opportunity for creating meanings where children and adults reflected on views and experiences in relation to taking action in and for the environment. This rich and descriptive data was used to understand and describe the children's perspectives on being agents of change within the context of this study.

3.2.5 Meaning

Bogdan and Biklen (2007) stress the importance meaning has to qualitative research. During qualitative research the researcher remains focused on learning the meaning that the participants hold about the issue or topic, rather than focusing on the meaning that the researchers bring to the research (Creswell, 2013). Bogdan and Biklen (2007) refer to this as 'participant perspectives', or in other words, how different people make sense of their lives. The importance of meaning influenced the research design. The approach allowed the children to participate in many different ways to share their perspectives. This research design positions the children as social actors who participate in constructing knowledge through their daily experiences and interactions (Harcourt & Conroy, 2011). Participant perspectives were critical for this study, given the focus was to learn about how the children viewed their role as guardians of the Earth and if they placed value (if any) on this role and in caring for the environment.

3.2.6 Interpretive Approach

Neuman (2007) suggests that the interpretive approach is the systematic analysis of socially meaningful action through observation of people in natural settings in order to arrive at

understandings and interpretations of how people create and maintain their social worlds. This perspective makes the interpretive approach fitting for the purpose of this study as it seeks to "describe, analyze, and interpret features of a specific situation, preserving its complexity and communicating the perspectives of the participants" (Borko, Liston & Whitcomb, 2007, p .2). An interpretive approach is characterized by a concern for the individual.

Borko, Liston and Witcomb (2007) support and highlight this link to context. They note that an interpretive approach is a search for local meaning as it attempts to capture local variation through descriptions of settings and actions, and through interpretation of how actors make sense of their socio-cultural contexts and activities. The research design for this study focused on inquiry that went beyond impressions to uncover the actual structures of the children's world. This included observations in a context familiar to the children where they have made strong connections with people, places and things.

The interpretive approach was chosen because it was more flexible, adaptive and responsive to the participants. It enabled understanding of the individual's perspectives, their stories, ways of being and actions within a social context and natural setting. These are all critical aspects when involving young children in a participatory research process.

3.2.7 Participatory Approach

In keeping with ECEfS a participatory research approach was followed to ensure the children's agency in this study. During the research careful consideration was given to the culture of communication. Such a culture required comprehension of the ways children express and represent their ideas; the relationships between the children and myself; and the awareness of power issues, given that participatory research is a social process (Christensen, 2004; Danby & Farrell, 2004; Peters & Kelly, 2011).

Research design decisions were ongoing to ensure that the children were seen as rights holders who are competent to engage in meaningful dialogue and act as active participants in the process (Clark, 2005a; Dockett & Perry, 2007; Maykut & Morehouse, 1994). The research design was fluid, as discussed earlier, to maximise ways for the children to share their ideas during their day to day interaction. Clark (2005a) and Te One (2007) support the view that research which values children's active participation and that listens to the diverse voices of childhood makes an significant contribution to the discourse on children's rights. This view is also supported by Dockett and Perry (2007), who state projects should "seek to promote children's involvement in ways that recognise the competence of children and emphasize the importance of the perspectives of those living the experience" (p. 48). In a participatory approach children's perspectives are recognised as valid evidence in understanding their social world and where adults take such viewpoints seriously.

In this research a diverse range of data collection methods enabled multiple ways for the children to communicate as outlined later in this chapter. Such diversity is entirely consistent

with a participatory approach. This approach was essential in gaining the children's perspectives for this research.

3.3 Participant, Recruitment and Selection

Recruitment approval to access the participants was initially gained after presenting my research proposal to the kindergarten's head office managers and the teaching team. Once initial approval was gained, an information sheet (Appendix A) explaining my plans and consent forms (Appendix B) were made available to the head office managers, the teaching team and all the children and the families of the kindergarten. I invited participation from all the children that attend this kindergarten, their parents/guardians, the three teachers, and the teacher aide. At the time of the research there were 58 children enrolled at the kindergarten, with a maximum of 40 children attending on any one day. The children did not necessarily attend the kindergarten for the licensed 30 hours per week. Some families chose to stagger their child's hours of attendance over the five days on offer. All but one child agreed to participate in this research. This child's parents agreed that he could participate, yet the child declined. It was of great importance to me to respect and honour this child's decision.

Children were identified as participants, when they were involved in, showed interest in, or discussed environmental topics relating to education for sustainability during the daily routines at kindergarten. The number of participants was fluid and interchangeable, as children opted in and out of the activities or discussions during the data collection period. To

honour the child who opted not to participate in this research, when he joined in during any of the data collection sessions, I ensured that his voice was not recorded. I also did not take any photos of this child during the data collection period, or use any of the learning stories where he was mentioned or that included him. The participant pool consisted of 28 boys and 29 girls. Within this group there were three two year olds, 28 three year olds and 26 four year olds. Parents and teachers were asked to participate if more information on children's play, perspectives or ideas was needed. All the teachers at this kindergarten were fully qualified, registered and experienced teachers.

3.4 Positioning Myself in the Research

In qualitative research, meanings are subjective and therefore it is important to identify bias. My position as Head Teacher at the kindergarten should be acknowledged and my involvement in the Enviroschools programme at the kindergarten since 2004. As this kindergarten has a strong education for sustainability focus in the curriculum, there is the possibility that the children were already well informed and involved in many activities that relate to education for sustainability. In order to manage this bias, regular meetings with my research supervisors to discuss interpretation and analysis of data were scheduled during the study. These regular meetings ensured that reliable analysis of the data took place. Our discussions and deploying a range of interconnected interpretive practices, such as analytical memos, ensured that I gained a better understanding of the data and subject matter therefore limiting any assumptions my bias might have shaped.

While working at the kindergarten I wore identification to inform the children and families of the researcher role I was taking during the research, compared to my usual teacher role. At this kindergarten the children are familiar with the concept of wearing monitor badges, to inform others of their role as a monitor in the environment. I used this concept to create a 'researcher' monitor badge. This badge clearly differentiated my role as researcher from teacher. I wore this badge for the four weeks collecting data. My badge was made with the children, and they in turn made several of their own research badges to wear during this time. For one of the participants, knowing when I wore my research badge was very important and she would often check with me to know if I was recording data or not during this time. I also explained my role as researcher and shared the tools I used to collect the data, such as the digital recording devices, with the children so they had time to ask questions, discuss what research meant and experience the tools before I started collecting data. This was important to ensure that the children were familiar with, felt at ease and had an understanding of the research process. This was of great importance to me as I was conducting research with the children, not on them.

3.5 Data Collection

Supporting and capturing children's voices is a complex, challenging and multi-layered task (Peters & Kelly, 2011).Therefore gathering varied and extensive data was important for this research. The data collection process required a commitment to multiple, and innovative ways of gathering data in order that the children were heard as authentically as possible (Peters & Kelly, 2011), and to ensure their rights to actively participate in this research were honoured.

To reduce the shortcomings of a single method approach, data was gathered using a mosaic approach (Clark, 2005a). "The mosaic approach is a way of listening that acknowledges children and adults as co-constructors of meaning" (Clark & Moss, 2011, p. 1). It is a strengths-based framework for viewing children as competent, active, meaning makers, and explorers of their environment. The mosaic approach brings together a range of methods for listening to children's perspectives about their lives. It combines the visual with the verbal and seeks to reveal the complexities of the children's lived experiences in a multi-dimensional world (Clark & Moss, 2011). The mosaic approach reflects the sociocultural perspective on children's learning within *Te Whāriki* (Ministry of Education, 1996). Malaguzzi, the first pedagogical director of the Reggio Emilia preschools in Italy, also challenges adults to discover 'the hundred ways of listening' and hearing the 'hundred languages of children'(Clark, 2005b), which inspired this approach because it allows multiple ways of listening to the languages of children.

The four elements of a mosaic approach compliment and support a qualitative research method. These elements include:

a) multi- methods, in order to recognise the different voices or languages of children;

b) participatory, where children are treated as experts and agents in their own lives in ways that are respectful of children's views and their silences;

c) reflexive, implying that all participants reflect on meanings, and address the question of interpretation; and

d) adaptable, focused on children's lived experiences that are embedded into practice (Clark, 2005b; Clark & Moss, 2011).

The multi-method approach has been developed to promote reliability in qualitative research. It employs a range of methods that are interesting and meaningful for children (Dockett & Perry, 2007). Typical data collection tools for the mosaic approach that I utilized included: observation during day to day activities; interviews; digital photos; recorded conversations; discussions; copies of children's work; and learning stories. I selected these particular tools because the methods were familiar to the children. Employing multiple tools provided choices for the children and provided opportunities to communicate in a way that made them feel empowered and capable. The different tools acknowledged the children's various interests and experiences. This multi-method approach was an important aspect to ensure trust and in gaining the children's perspectives for this study. Each of the data collection tools is described in the following sections.

3.5.1 Observation

Clark (2005a) suggests observation as a data collection tool because of its strong tradition within early childhood education and its use for understanding young children's abilities, needs and interests. Observation remains a foundational method of listening to young children, as observation allows the researcher to develop an understanding of children's perspectives on their experiences and on the circumstances for their actions. Similarly, Cohen, Manion and Morrison (2007) discuss the use of observation as a data tool. They state that qualitative research

> …draws the researcher into phenomenological complexity of participants' worlds; here situations unfold, and connections, causes and correlations can be observed as they occur over time. The qualitative researcher aims to catch the dynamic nature of events, to see intentionality, to seek trends and patterns over time. (p. 397)

Observations of the children's actions, interactions and conversations enabled data to be collected during the day to day kindergarten routines and environment. Opportunities naturally transpired where children enacted and shared their ideas, and were involved in practices that displayed guardianship (kaitiakitanga) and or care (manākitanga) for the environment. Observation enabled data collection during individual or group situations or play events within the daily routines.

Digital photographs, recorded conversations, discussions, and copies of children's work all drew directly from actual observations. Of particular importance were digital recordings of conversations, as well as the children's everyday play conversations. As anticipated, some observational data sparked discussions around the circumstances of children's actions, enabling a greater understanding of the children's working theories. Photographs of the children's art work and play prompted conversations with the children about their thoughts and understandings of the role they took in that interaction, and in turn the environment and their perspectives on their actions. These recordings were made on an iPad, using the iTalk application, which were later transcribed for analysis. For transparency and trustworthiness, I requested children's verbal permission before each recording. This ensured ongoing informed consent to participate in this research. At times I was a passive observer and listener during the observations or recordings. At other times I was an active participant in the discussion or play routines, combining my role as teacher/researcher.

3.5.2 Interviews

An interview is simply a conversation with a purpose. This purpose is to uncover and gain an insight into the lived experiences of others, reveal realities and provide information (Schostak, 2006). Unstructured interviews were conducted with parents and teachers when clarification or more information about a child's actions, comments or play were needed to help make sense of a child's working theories or views about their role as guardians.

At these interviews I shared my observations or copies of the child's work, followed by questions to gain their thoughts on what they know or might understand about the child's play or actions. As expected this led to discussions about background information that may have contributed to the play episode and child's explorations, and the adults' understanding or ideas about the play. The background information was valuable information to help analyse, clarify and make sense of some of the data I collected. It ensured that I minimized my assumptions about children's actions or ideas about the environment.

The parent or teacher interviews were either digitally recorded and transcribed, or analytical notes were made post interviews. Although interviews were an important part of the data collection process for this research, a greater emphasis was placed on the children's thoughts and interactions, as the focus of this study was on the children's understandings and perspectives.

3.5.3 Learning Stories

Learning stories are a narrative assessment tool linked to *Te Whāriki* (Ministry of Education, 1996), used by teachers to plan for children's interests. Children's learning stories are a typical component of sociocultural assessment and are seen as a collaborative process, bringing together teachers', parents' and children's voices in a presentation of dialogical meaning making (Kupfer, 2011).

The children's learning stories were only copied from individual children's profile books when the story added depth and understanding to a child's actions, interests and explanations about their role as guardian of the Earth. The learning stories provided a timeline, insight into prior experiences at the kindergarten or home, and the child's interest in education for sustainability at this kindergarten. I used learning stories to spark conversations with individual children but because the focus of this research was to understand the children's perspectives, and as learning stories are normally written from an adult's perspective, their use was kept to a minimum. They were used to gain further understanding about a child's engagement in nature, their experiences, views and understandings.

3.6 Analysis

Data is simply a collection of information. On its own it does not tell the full story. It is the analysis of the data that brings meaning and enables understanding. Maykut and Morehouse (1994) explain that the process of qualitative data analysis takes many forms, but it is

fundamentally a nonmathematical analytical procedure that involves examining the meaning of people's words and actions. Nonmathematical analytical procedures typically involve data managing, reading/memoing, describing, classifying and interpreting.

Falk and Blumenreich (2005) advise that data analysis and interpretation is an ongoing process that begins when you start gathering the data. This was the case for this research as analysis took place in phases. The raw data collected was subject to analysis as the study progressed through the keeping of a research journal in which I recorded my thoughts, questions, reactions, observations and interpretations, as well as descriptions of the setting, activities and interactions within the kindergarten. I began the analytical process by identifying and highlighting examples of education *in*, *about* and *for* sustainability as well as possible links to the research questions as broad coding guides. Further analysis of the data from this research involved a process of mapping the patterns in the children's understandings, attitudes, enactment and ideas about their roles as guardians of the Earth and care of the environment. All digital recordings were transcribed, and written observations photocopied and reviewed numerous times. A colour coding system to map similarities, differences and themes in the children's thinking was used. Mapping the children's thinking was essential to understand how the children perceived the world and made sense of it. Specific themes and variables in observations, interviews and learning stories were identified. These themes are shown in Table 1 (Appendix C).

The themes guided my memo writing and the analysis of the children's conceptual understandings and their attitudes about, and engagement with nature, their community and the Earth. Throughout this analytical process a metaphor and analogies were also identified.

3.7 Trustworthiness

Clear intentions and perspectives were established at the outset of this research for reasons of integrity, reliability, accountability, and validity. While the trustworthiness of qualitative research is sometimes questioned, rigorous frameworks that promote trustworthiness have been in existence for some time. Merriam (1998) states, "all research is concerned with producing valid and reliable knowledge in an ethical manner" (p. 198) and I have sought to achieve that with this research. However, the terms validity and reliability have been substituted with trustworthiness as this research is not looking for uniformity, but rather it is looking for rich data.

Cohen et al. (2000) recommended that validity be strengthened by the use of several data collection methods to ensure triangulation. They explain this as an attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint. By using several different data collection methods (observation, interviews and learning stories) and the tools within these, I sought to ensure trustworthiness for this research. Using multiple methods and tools allowed this triangulation and reflected the multiple perspectives of the children.

Producing trustworthy research is of importance so that it can be replicated or more importantly, used by others. This research can be seen as trustworthy because the design of

the research, and the approach in which the data has been collected, analysed, interpreted and presented has carefully been thought through and made transparent.

3.8 Ethical Considerations

Ethics in research are the principles of right and wrong that a particular group accepts at a particular time. Research undertaken with human subjects sets out values in codes of ethics, which are written contracts between the researcher and the participants at the beginning of the research process. As a researcher I felt bound by my ethics which were honesty, children as participating subjects, trust, relationships, being respectful, no harm, choices and informed consent.

There is a growing body of literature that discusses the rights of children in research, and these ethical considerations were particularly relevant to this research. Children are recognised for the insights they bring to research designed to improve education (Clark, 2005a; Peters & Kelly, 2011; Smith, 2007; Te One, 2007). By maintaining a rights perspective alongside consideration of generic principles, researchers can become ethically accountable to the children (Gallop, 2000; Hedges, 2002). Codes of ethics endeavour to ensure that participants enter the research projects voluntarily, understanding the nature of the study, and the risks and requirements that are involved. In ethical research participants are not exposed to risks that are greater than the gains they receive. In qualitative research guaranteeing this can be difficult. In some cases it is unknown what ethical issues will emerge until the researcher is out in the field. In addition because of the generally closer relationship between the researcher and the participants, there is a higher degree of

collaboration in the process and participants are encouraged to make decisions about the research project (Christensen, 2004; Peters & Kelly, 2011).By having a fluid research design, the children collaborated in the project and were informed about the process they were participating in. The findings of this research were shared with the participants in the form of a book, appropriate for their age group. (Appendix D). The purpose of this book was to ensure that the children's agency in this research were acknowledged and celebrated. It also ensured that I fulfilled my ethical obligation to ensure the participants had the opportunity to hear about the findings of this research.

3.8.1 Honesty and Truth

Researchers are obliged to deal with their participants and their research community in an honest and truthful way. Respect and reciprocity are also important recurring concepts described in research appropriate to tikanga Māori. Tuhiwai Smith (1991) points out the fundamentals of researchers being culturally sensitive and respectful of the participants' mana. Voluntary participation means that children feel comfortable with a researcher and are genuinely able to choose to participate. Children are more likely to respond openly and honestly if they feel respected and safe, and this usually depends on the skill of the researcher in putting them at ease, minimizing the distance between the adult and the child, establishing shared interests and a dialogue, and putting the child in the position of the expert (Gallop, 2000). As stated earlier this was one of the deciding factors for selecting the kindergarten where I work as the case study. Here strong relationships with the children and their families had already been established.

Given that participatory research is a social process, careful consideration was given to the research design, especially considering my role as teacher/researcher and ensuring children could express their ideas. A conscious effort on my part as researcher was made to encourage the shift of power and control to the children, through stepping back and listening, watching and asking open ended questions, or wondering aloud when needed during children's play and conversations. In this research, to ensure respectful and ethical practices were followed, the children, families and the teaching staff were well informed of the research topic, process and ethical issues that could be expected.

3.8.2 Informed Consent and Voluntary Participation

Ethical practices were also addressed during the consent process. Principles of informed consent state that consent must be gained from everyone involved in the research, at the level of comprehension and in the form and manner the participant can understand (Wood, 2005). Informed consent is appropriate for children as participants. Consent relies upon participants having sufficient knowledge of the research project, and their role in it, to understand what will be required of them, the harm or benefit that may result from participation and the right to withdraw their involvement at any time. Children's ability to give consent is therefore problematic, but it is possible, depending on the research context.

Involving children directly in giving consent gives children control and autonomy and is respectful to their rights (Hedges, 2002; Snook, 1999, 2003). While attempting to protect children from the consequences of decisions not made freely by them, researchers must also seek to not underestimate children's ability to understand what is said to them. Often, a key

criterion of ethical research is that children's consent is gained on behalf of them by agreement with parents. Yet it is suggested that adult consent should support children's consent, not replace it, in order to minimize any issues of harm for the participants. For this research the children were provided with a letter explaining the research and the expectations and processes of gathering data, using language that they understood. The letters were read to the children by their parents. The children were invited to ask questions and share any concerns they had with a parent or teacher. An information sheet was provided for parents and teachers to ensure they could respond knowledgeably to the children's questions and ensure continuity of discussions between kindergarten and home. To indicate that children were informed about the research, parents were asked to sign a consent form confirming they had read and explained the letter to their child, before children were asked to sign their own consent forms.

While there are ways voluntary participation can be explained to children in language they understand, it is still possible that some may not understand the concept of voluntary participation and could find it difficult to articulate any uncertainties or anxiety (Gallop, 2000). While written permission prior to beginning this research was essential, a single point in time agreement with the children was not seen as fully adequate because of the children's ability to retain such information, and to fully understand the purpose of the research (Wood, 2005). To mitigate this, during data collection, the children were reminded of the purpose of the activity, before recording their play or before any discussions. Permission to participate was gained verbally as recordings took place, and recordings were shared back to the participant to check that they were happy, and that their views or ideas were captured correctly. I also observed and noted children's body language. As a teacher at this kindergarten I knew the children well and could recognise any anxiety or hesitation. Where

participants seemed hesitant or eager to move away for example, I would take that as a nonverbal cue that they were not willing to participate at that time.

3.8.3 Minimising Harm

The principle of minimizing harm means that children are not put in any situation where they may be hurt or disadvantaged in any way. Preparation and competence are a crucial first step to minimizing harm. Special consideration should be given to younger children. Therefore the younger the child, the more care must be taken not to disrupt the normal environment of teaching and relationships during the research. As this research was conducted within the normal play context of the children, the potential for harm was minimized (Snook, 2003), as the children were familiar with me, the setting and the kindergarten programme.

Children are entitled to the same degree of confidentiality as adult participants in research (Smith & Bjerke, 2009), and participants had the right to withdraw from the research at any stage, and/or to withdraw information or data pertaining to them. The ethical processes of children participating in the research involved me listening to children regarding events and experiences that related to them. A pedagogy of listening stresses respecting children for their own perspectives. Such a standpoint involves describing children's everyday experiences in ways that recognise them as competent witnesses to their own lives (Danby & Farrell, 2004). A pedagogy of listening was applied to this research design enabling children to participate and competently share their perspectives on being guardians of the Earth.

3.8.4 Confidentiality and Anonymity

For this research particular care was taken to ensure the confidentiality of all data gathered. All data collection records remained confidential and access to data was restricted to myself and my supervisors. Both records and data were securely stored and will be retained for up to five years. Transcriptions of data, digital photos and photos of the children's work were kept on a computer file that required password entry. A back up copy was kept on disk and stored with field notes, photocopies of the children's artwork and learning stories in a locked study with the researcher. Data was used specifically for the purpose of this study and any related conference papers or journal articles that may follow.

This kindergarten is known because of the success it has had through the Enviroschools programme, and therefore I could not guarantee anonymity of the kindergarten. I met with the Kidsfirst association staff and they gave permission to be named as supporters of this research. As the kindergarten is well known, it meant that I could not guarantee the participants' anonymity, as children worked together and shared ideas during this research. There was the possibility that children, their families and the teaching staff could identify each other in this research. Children, families and teachers all consented to participate on the understanding that they and the kindergarten would not be fully anonymous. Real names have not been used in this study, nor will they be used in any future publications or presentations. Participants were given the opportunity to choose a pseudonym. Participants were also asked during the consent process for permission to use some of the digital photos and possible copies of learning stories for the purpose of presentations and publications. The research was subject to academic and ethical approval by the University of Canterbury Educational Research Human Ethics Committee.

3.9 Summary

This research was designed to capture children's voices and the research design reflects this fundamental aim. Qualitative, interpretive research is an efficient, rigorous and theoretically sound method of investigating and understanding the social world. It seeks to describe and answer questions about participants and contexts (Maykut & Morehouse, 1994). Qualitative research goes beyond mere reporting as it explores a particular intellectual puzzle that requires explanation.

The phenomena explored were the children's actions within the environment, their views on caring for the environment and taking on the responsibility of being a guardian. The children's perspectives were examined using a case study research design and a participatory research approach. This focussed on observing children in a familiar context, in their day to day activities, recoding their conversations and work relating to ECEfS. The children's experiences and actions were interpreted and made sense of through an interpretive framework. The following findings chapters demonstrates that this research design followed 'a most careful count' to ensure I paid the 'proper amount'[11] of care within this research which enabled me to gain the children's perspectives on being guardians of the Earth.

[11] Here I return to the reference from the Lorax at the start of this chapter.

Chapter 4: Parts and Pieces

> *Then he grunts, "I will call you by Whisper-ma-phone, for the secrets I tell are for your ears alone."*
>
> *~ Dr. Seuss*[12]

4.1 Introduction

The findings of this case study reveal 'secrets' that help answer the research questions, discovered by listening to the 'whisper-ma-phone'. The research questions focus on the children's perspectives on, and understandings about their role as guardians of the Earth. The research questions also focus on their understandings about being agents of change. In the findings chapters I present the key themes that emerged from the data and use examples of the data to illustrate these themes. The key themes connect to thinking around early childhood education for sustainability, and opportunities for learning generated through the children's ideas and actions.

I have used the concept of an ecosystem as a metaphor for this study. Ecosystems are a biological community of interacting organisms and their physical environment. They consist of a complex set of relationships among the living resources, habitats and residents (Ellis, 2011; Nature Works, 2014). Malaguzzi applies these ideas to an education setting:

> We think of a school for young children as an integral living organism, as a place of shared lives and relationships among many adults and very many children. We think

[12] From '*The Lorax'* (Seuss, 2006, p. 9)

> of school as a sort of construction in motion, continuously adjusting itself. (Malaguzzi, 1998, p. 62)

Similarly, I draw on these ideas in the findings chapters, to demonstrate the ways in which the children's actions, interactions and discussions in a kindergarten environment reflect the characteristics of an ecosystem.

This chapter focuses on the key components, or parts and pieces of an ecosystem and the connections between these. The parts and pieces include soil; heat and light; atmosphere and water, all of which are needed to ensure the survival of an ecosystem. I link these parts and pieces to aspects of the children's interactions with and involvement in the care of their environment, showing their perspective on being guardians of the Earth. The second findings chapter focuses on the community (harpori) of an ecosystem including the concepts of connectedness (hononga), multiple interactions (taunekeneke) and unity (kotahitanga). Linking these concepts to the ecosystem metaphor and ECEfS, I show how the children build their thinking and understanding of being guardians of the Earth and agents of change.

4.2 'Parts and Pieces'

The 'soil' component relates to the children's enactment, involvement and understanding of culture displayed through their identity in the role of guardians of the Earth. The 'heat and light components shows the children's action competence, ethic of care and understanding of the importance of role as guardians of the Earth. The 'atmosphere' component relates to the need for children to be right holders, active citizens and participants within their community.

Finally, the ‘water’ component concerns critical thinking and the development of the children’s working theories, thinking and perspectives on the role of guardian.

4.2.1 ‘Soil’ – Being Grounded

Soil is a critical component providing nutrients for the plants that support an ecosystem. Soil anchors the plants, absorbs and holds water for the plants and animals to use, and provides a home for many living organisms (Nature Works, 2014). Within an ecosystem, soil is a key component that provides nutrients, food, a sense of home and support. For this ‘kindergarten ecosystem’ to survive and prosper there were several essential characteristics that contributed to the well-being of this kindergarten community. Samuelsson and Kaga (2008) suggest that children acquire an identity, firmly grounded in the ‘soil’ of a culture closest to them, while developing a sense of themselves as world citizens. The children were grounded in the ‘soil’ of this kindergarten community’s culture of care, respect, wonder, empathy, enjoyment and value of and for the environment. The ‘soil’ ensured that these kindergarten children acquired an identity of agency, and a strong sense of care (manākitanga) for the environment. As soil provides nutrients and a sense of home the same can be said for diversity and democracy, which are key issues which anchor, feeds and supports a culture of education for sustainability.

The children and kindergarten community are grounded in a culture of care, respect, wonder, empathy, enjoyment and value of and for the environment. Figures 1- 12 are illustrative of being grounded in the everyday actions, soil or culture of valuing and caring for the environment.

Figure 1 - Yoshi proudly showing her artwork of the bird she spotted in the playground.

Figure 2 - Michelangelo feeding Freddy the flies he caught at home.

Figure 3 - Fireman Sam pretending he is on a boat, while visiting the local reserve.

Figure 4 - Sleeping Beauty with one of her discoveries while at the local reserve.

Figure 5 - Lou cleaning the fish tank.

Figure 6 - Lizzy and Isabella making discoveries at the local reserve.

Figure 7 - Alex introducing the Kakapo puppet to another Kakapo on the computer.

Figure 8 - Carolkey with a harvest of radishes to share.

Figure 9 - Isabella and Ciara found loose natural materials to have fun together.

Figure 10 - Smiley Face pretending to be a sleeping butterfly in her chrysalis on the branch.

Figure 11 - Hilda enjoying a roll down the bark hill at the local reserve.

Figure 12 - Sage, knee deep in the mud at the local reserve making discoveries.

The children are keen observers of their environment and share the wonder of what surrounds them, securing them in their connections with the environment as observed in this conversation between Alex and Stella Lamaze (refer figures 13 and 14):

Alex:	Look at this. I wonder what made that?
Stella Lamaze:	I don't know [pause] look it goes all the way up and all the way down.
Alex:	There are lots [pause, seems to be looking and following a line.]
Stella Lamaze:	There is too many. [Giggles]
Alex:	Look a snail! There is a snail!
Stella Lamaze:	Where?
Alex:	Look here, it is a baby!
Researcher:	Oh there now I see it, you're right Alex it is a very tiny snail. My goodness it must be very tired after making all those trails on the window this morning. [We all laugh.]

Figure 13 - Stella Lamaze and Alex discovering lines on the butterfly house glass.

Figure 14 - The snail trail.

Here Stella Lamaze and Alex are equally excited about discovering the cause of the lines on the window of the butterfly house, and they are grounded in the 'soil' or culture of sharing and exploring their discoveries.

Similarly, Olivia shows an appreciation of the cloud formations and it inspires her subject choice for her photography (refer figure 15).

Figure 15 - Olivia's photos of the clouds.

Researcher:	Olivia I am wondering why you took photos of the sky?
Olivia:	I like the clouds.
Researcher:	I noticed that you often take photos of the clouds. Why do you think you like the clouds so much?
Olivia:	Uhm [pause] because they are soft.
Researcher:	They do look like they could be nice and soft. Especially today there is so many clouds in the sky we can almost not see the blue.
Olivia:	I think it will rain because look [pause] that cloud is dark.

Olivia has built a working theory about clouds based around her interest, wonders and observations. She is aware of the differences between rain clouds and other clouds. This understanding was fostered through several observations and studies of what is happening in the sky above her. The observations and studies nurtured and fed the 'soil' of her interests in nature.

The kindergarten culture encourages children to become critical thinkers, observers and participants of their world, an important aspect of education for sustainability. This is demonstrated in a conversation between Raceman and Joyce (a teacher) concerning a list he needed to create for looking after the community gardens.

Raceman:	Write about the community.
Joyce:	Which part are you talking about?
Raceman:	The community gardens.
Joyce:	What next?
Raceman:	The scarecrow, the plants and about that big carrot we picked one day, with the funny eyes.
Joyce:	Anything else?
Raceman:	I got it, all the trees and the leaves, and if somebody mows the grass, and the signs. It's not far to the community gardens…
Joyce:	Did you want to go?
Raceman:	No I just want to look after the community gardens. If I go I will bring that with me.
Joyce:	This list?
Raceman:	Yes.

In this interaction Raceman is showing his connection to the community gardens. He understands he has a role to play in caring for the community gardens, which is firmly grounded in the 'soil' of this kindergarten's practices and processes. He is familiar with the systems to take action, including list making, which will allow him to share his views with others. He has a strong sense of himself as participant who can take action.

An ecosystem is a collection of collaborating sub-systems. Children are influenced by both their microsystem, or immediate surroundings, and their mesosystem, or the interaction between microsystems (e.g. home and kindergarten, church and kindergarten etc.) The children are connected through the culture of their wider experiences, through their observations and interactions within these systems. Ellie and Stella Lamaze connect their ideas of being guardians of the Earth to their prior experiences with families in the community.

Researcher:	What is important about our environment? Why do you think we need to look after it?
Ellie:	For the Earth.
Researcher:	Why is the Earth important?
Stella Lamaze:	Because the bugs and plants.
Researcher:	Because the bugs and plants on the Earth…

Stella Lamaze:	I know [pause] people.
Researcher:	Yeah, people live on the Earth.
Ellie:	And God, I know God. He helps us.
Stella Lamaze:	He makes everything.
Ellie:	He is the most powerful.

Each child brings with them the 'soil' or culture from their microsystems, their own interests, experiences, values and insights on why we should care for our environment. For Ellie and Stella Lamaze this includes ideas about God and the importance of the Earth.

At times however, values and practices conflicted with play ideas, as was the case in this observation, where Jonny left the tap running (refer figure 16):

Figure 16 - Lou and Raceman using their buckets at the water drum.

Olivia:	Jonny the tap is not off, you need to turn it off.
Raceman:	No, I want it on… we are making a river.
Olivia:	But you need to turn it off.
Lizzie:	Yes that's wasting the water.
	[Oliver came over with a bucket.]
Oliver:	I have a bucket. I'll tip it in the river.
Olivia:	Yes use a bucket!
Raceman:	I can use a bucket.
Sparkles:	Me to… look this bucket works.
Lou:	Let's use buckets. Then we can turn the tap off.
Raceman:	Ok. Here is another bucket for you.

In their co-construction of solutions to the problem of water wastage (where microsystems meet), Olivia, Raceman, Lizzie, Sparkles and Lou were able to reach a mutual, democratic agreement enabling them to enjoy their play while conserving water. This democratic culture nourishes the 'soil' of this ecosystem. The children are able to apply their thinking and experiences from the microsystem to different mesosystems as they co-construct solutions.

Taking responsibility for actions was one such solution which resulted in the children having a focus on safety and litter. The children saw it as their responsibility to take action and clean up the rubbish and maintain their environment. The children are involved in daily rubbish collection at kindergarten, and on planned walks the children also go into the school environment and community to help collect rubbish.

Figure 17 - Michelangelo and Jonny collecting rubbish in the playground.

[Michelangelo and Jonny (refer figure 17) came out calling rubbish hunt. Lou and Sage joined. The group only found a few very small pieces of rubbish.]

Lou:	We don't want animals to eat the rubbish.
Researcher:	Why don't we want animals to eat it Lou?
Lou:	They will die and then the Earth will die!

Lou and Michelangelo connected the need for caring and cleaning up to their understandings of the dangers rubbish could have on the environment. Here Lou explains that rubbish is a danger to animals and in the bigger picture, to the Earth.

Further, Michelangelo had an understanding that rubbish could be a fire risk and therefore a danger to us all. On more than one occasion, he indicated that the danger of litter causing fires was his main concern and a driving force for picking up the litter in his environment.

Researcher:	What is the reason for picking up the rubbish at school?
Michelangelo:	Because it is for the environment.
Researcher:	I am wondering what is making you pick up the rubbish, because lots of people walk to kindy and they just walk past it. They don't pick it up. So what is making you pick up the rubbish?
Michelangelo:	Because it is part of our environment.
Researcher:	If you leave it there what could happen?
Michelangelo:	It might cause a fire…
Researcher:	Michelangelo is that something that you feel is something to do as one of your jobs…to clean up the environment.
Michelangelo:	Yes.
Researcher:	Why do you think that is your job?
Michelangelo:	Because I have to pick up rubbish every single day.

Michelangelo made it his mission every morning to collect as much of the rubbish that he could in the school grounds while walking to kindergarten. This led to Tinkerbelle following suit on her walks in the community. Jonny, Lachlan and Alex joined Michelangelo in taking on the rubbish monitor role at kindergarten ensuring the kindergarten environment was pristine and also maintained. Michelangelo continued to take on this responsibility after transitioning to school, showing he is firmly grounded in the 'soil' of the practices he participated in and at times led at kindergarten. As seen in figure 18, Michelangelo was

passing a handful of rubbish to Rosie (a teacher) though the kindergarten window while on a school visit.

Figure 18 - Michelangelo collecting rubbish at school and passing it through the kindergarten window.

The act of collecting rubbish also revealed a culture of understanding amongst the children that this role was far too big for just one person but needed a collaborative approach, where they all had to take responsibility. This is shown by Tinkerbelle and Sage's view that the job would be easier if everyone helped, which were nourished by the 'soil' and practices of this kindergarten. They also made a connection to safety, in regards to litter and caring for the Earth that they live on.

Researcher:	So if we don't look after the Earth, what would happen?
Tinkerbelle:	It would not be safe.
Researcher:	No, so what do you think is your job?
Tinkerbelle:	Uhm [pause] it is to look after it.
Researcher:	And how do we look after it?
Tinkerbelle:	Uhm, we, uhm we look after [pause] we have to do tidy [pause] like if we don't tidy up the rubbish on the Earth, then it, then it will it will be all messy with rubbish.
Sage:	I'm thinking I would not like to live on an Earth that is all messy with rubbish.
Tinkerbelle:	No.
Raceman:	Not me.

Researcher:	What about animals would they like living on a world that is really messy.
Sage:	NO.
Tinkerbelle:	No.
Sage:	You have to tidy it up [pause].
Tinkerbelle:	You and me hey.
Sage:	Yes and you have to look after the Earth.
Researcher:	We need to look after the Earth, so what kind of things do we do.
Sage:	We don't get the rubbish up to the Earth [pause] up to the sky.
Researcher:	So what do we do with our rubbish?
Tinkerbelle:	Uhm [pause] put it in the bin.
Sage:	Put it, put it in the recycling bin [pause] because it is yuck, the rubbish.
Tinkerbelle:	It turns into a [pause] when it goes to the dump, and it, and it turns into poison.
Sage:	We put into that green bin there.
Researcher:	Yip, so what happens to that rubbish?
Tinkerbelle:	That goes to the dump.
Sage:	No not the recycling ones Tinkerbelle, remember that is the rubbish from the rubbish bin, but the recycling bin things where do they go again?
Tinkerbelle:	Goes to the dump and then it makes it all poison.
Sage:	And make sure it does not fall down [pause] not put the worms into the dump and then it turns into poison.
Researcher:	So what do we do with our food scraps here?
Tinkerbelle:	The worm farm!
Sage:	Yeah the worms. Do they like it?
Joyce:	Yes they do, they like it. And the worms make our compost.
Sage:	Yeah, and they will all poos…
Researcher:	Mmm…do you feel that it is a big job looking after the Earth?
Sage:	Yes.
Tinkerbelle:	It's a too bigga job.
Researcher:	So what will help make the job easier?
Tinkerbelle:	Mmm maybe work together?
Sage:	YES.

Both Sage and Tinkerbelle had a theory that litter is poisonous to the environment and the worms and therefore are a danger to us all. Through their conversation with each other they are sharing their thinking and theories on rubbish separation and recycling as they try to make sense of the different systems. All the children in this observation have built or are building their identity within this culture of caring and taking action. This has influenced their perspectives on the role of guardian of the Earth as they actively participate and take

collective action for the environment. The children's understanding about their role as guardians of the Earth are grounded in the culture and identity of care, empathy and respect. The children co-construct this culture, anchored in the 'soil' of kindergarten practices and values. The children's environmental identity drives their actions and they place great importance on this role. This ethic of care takes energy and effort. Just as important as soil, so too is getting some sun (or energy) to an ecosystem. The following section builds on the children's action competence and manākitanga leading to the next component of 'heat and light'.

4.2.2 'Heat and Light' - Getting Some Sun

Heat and light from the sun is critical to the health of an ecosystem, as it converts energy through the ecosystem (Nature Works, 2014). Learning respect, kindness and compassion are essential for education for sustainability. Just like heat and light energy transition takes place when children are engaged in intellectual dialogue regarding sustainability, including learning for compassion, respect, equality, fairness (Samuelsson & Kaga, 2008) and an ethic of care. Through the children's engagement in intellectual dialogue and learning about compassion, kindness, equality, fairness and an ethic of care an energy (heat and light) transition took place which positively influenced the health of this fragile ecosystem. The children showed that they were right holders and active participants. I argue that this guided their understanding and perspectives on their role as guardians of the Earth and the action they took within their kindergarten community.

An ethic of care is a relational ethic where care requires both intellectual competence and critical thinking; it emphasises feeling and moral sentiment (Noddings, 2003). An ethic of care stresses relationships and responsibilities, attentiveness and an understanding of others. This relates to the principle of manākitanga, with a focus on the children's sense of duty, justice, empathy and value for the world around them. This was observed during a conversation where the children revisited a newspaper story about some of the Longfin eels at a wildlife reserve they were familiar with, which had been killed by vandals:

Researcher:	Now one of the reasons I came over to sit with you here Holly was I heard you talking about the eels and I wonder do you remember when we were raising money for the endangered animals.
Holly:	Yeah.
Researcher:	I remember, you did a special job for that, didn't you. Can you remember what that was?
Holly:	I drew an eel.
Researcher:	That's right you drew a picture of the longfin eel and then you did jobs at home to get money for the longfin eel is that right? [Holly shakes head affirming question] I'm wondering what made you choose the longfin eel?
Holly:	I made my bed and dress myself when I wake up.
Researcher:	So those were the jobs you did at home, make your bed and dress yourself. Were there any other jobs you had to do to get pocket money?
Holly:	Helped wash the car. [Leila, Carol key and Jack joins the conversation]
Researcher:	So you washed the car, you made the bed, you dressed yourself. Any other jobs because you raised quite a bit of money for the longfin eel. You had an envelope of money that you brought to kindy that we had to send away.
Holly:	Help mommy clean the dishes.
Researcher:	I am wondering why you thought of the longfin eels, why not any other animal. What made you choose the long fin eel? [Pause]
Holly:	Because we talked about the longfin eels from Willowbank [the wildlife reserve] when those children were so naughty and mean.
Jack:	I know [pause] why did they?
Researcher:	I don't know Jack, it is a bit sad that those people killed those eels.
Jack:	Yes, they killed them. That's not nice.
Researcher:	No, what do you think [pause] what would you say to those people?

Carolkey:	Say [pause] Stop it I don't like it.
Jack:	And what if you said STOP.
Holly:	Yes say stop it I don't like it.
Carolkey:	Yes stop killing those longfin eels, because they are special.

During the children's conversations and interactions a sense of care towards the environment and each other is evident. The children involved in this discussion are gaining an understanding of what it means to be citizens through their formal and informal citizenship education at this kindergarten. These interactions have wider implications. The attitudes of this group of children as citizens, influences the decisions they make and the actions they take. It is the energy they need to keep the ecosystem healthy. Hayward (2012) suggests that through everyday interactions children learn new ways to think about citizenship agency, their environment, how decisions should be made, what is just and fair, and empathy for other ways of living.

In another observation, Sage had a strong opinion about the value of butterflies. She showed empathy and a duty to protect these creatures while looking at a dead butterfly which she found on the ground after a rainy day (refer figure 19).

Figure 19 - The butterfly Sage found.

Sage:	We need to look after butterflies. That is sad that it is dead.
Researcher:	Why do we need to look after them?
Sage:	Because then they will not get hurt.

They are important to our garden, and the flowers [pause]. That is my job.

Researcher: What is your job?

Sage: To look after them.

Sage displays a sense of responsibility and care towards butterflies and considers the potential consequences of her actions on others (people and things).

In a similar scenario Liam showed empathy, kindness and care towards Rose as seen in this learning story written by one of the teachers:

> When Rose arrived with her mum and sat down with another teacher, she too was sad to say goodbye to her mum. She was crying and looking very sad. Liam, you sat and watched Rose for a little while, then quietly asked me "Why is she crying?" I reminded you about how you had felt earlier when your mum had left, and that she was feeling the same way. I also pointed out that you were now sitting bravely on the mat and I was sure that before too long Rose would be feeling brave too! I could see that you thought about that for a bit, because you then said to me, "I can get her a toy to play with". When I told you that I knew she loved playing with the dolls, up you hopped and off you went to the family corner, returning with a doll for Rose. How confident you were as you walked across the group where Rose was sitting and handed her the doll. She seemed a little surprised at first but having the doll to cuddle really did help her settle and feel more secure. Liam, your empathy and concern was very moving and the teachers all talked about it later in the day. What a special gift you have to be able to understand others feelings and to act with confidence to make a difference for them.

In these examples, both Liam and Sage showed kindness and a strong sense of empathy and compassion for the people and things around them, gently touching them just like a ray of sunlight. They showed a strong connection to the people and things in their environment, transferring their energy. They showed that they value their environment and the relationships within it and were committed to the role of guardian.

Lewis, Mansfield and Baudains (2008) argue that: “Values education can make a very important contribution to fostering strong positive relationships, positive dispositions to learning, producing a calm teaching and learning environment and providing emotional and spiritual space” (p. 139). Several recordings and learning stories illustrate children taking responsibility for maintaining and caring for their environment, showing that they value and have built strong relationships within this kindergarten. The following photos captures some of these recordings and learning stories as seen in figures 20-23.

Figure 20 - Alex feeding the food scraps to the worms.

Figure 21 - Leaf and Kila taking responsibility to ensure Margalo is fed and his cage is clean.

Figure 22 - Working at the community gardens.

Figure 23 - Recycling the old paintings and paper into paper bricks.

The children who took responsibility and participated in these conversations and actions that occurred when the above photos were taken, have agency within this kindergarten

environment. One example of a conversation and action was illustrated when Sage and Libby- Eloise refilled the birdfeeders (refer figure 24).

Researcher:	Why did you want to refill the birdfeeders Sage?
Sage:	Because they were empty.
Researcher:	Could we not just leave them empty?
Sage:	Noooo silly, they need to have food in them for the birds.
Researcher:	Oh right so why are we doing this for the birds?
Sage:	Yeah, they need the food.
Researcher:	Could they not get food from somewhere else?
Sage:	No there is no food so we are helping. I like doing this.
Researcher:	Why do you like feeding the birds?
Sage:	Yes, I like birds.
Libby Eloise:	Me too.
Researcher:	I like hearing them sing.
Sage:	[Laughs, pause] that's why we need food for them.
Researcher:	So they sing?
Libby Eloise:	No so they come to us.
Sage:	And sing.
Researcher:	Is this a job that helps Papatuanuku and the creatures that live on her?
Sage:	Yeah, we care for the birds. Is there more?

Figure 24 - Sage and Libby Eloise refilling the bird feeders.

Sage and Libby Eloise have a strong sense of ethics and moral standing towards caring for the birds in their environment. They both felt the need to ensure that the birds were well fed and cared for during the winter months and showed an appreciation of these creatures.

Noddings (2003) argues that with moral education, from the perspective of caring, there is the need to consider four major components: modelling, dialogue, practice, and confirmation. Role models need to conduct the sort of behaviour they seek to develop in the young. Within this kindergarten environment the children are involved in and experienced a culture of care through: a) modelling between adults and children; and children and children (refer figures 25 and 26); b) dialogue (speaking and listening, where adults listen and are responsive to their needs and interests) as seen in figures 27 and 28; c) practice that shows engagement in action of care for people, places and things (refer figures 29 and 30) and d) confirmation of an ethic of care (refer figures 31 and 32).

Figure 25 - Fletcher modelling how to care for the new gardens to Ryan.

Figure 26 - Rosie (teacher) modelling the importance of physically connecting with the environment as she joins in the play to see if they would fit in the big hole the children dug in the dig pit.

Figure 27 - Fletcher sharing his dialogue with Rosie (teacher) and friends on why they need to refill the sugar water feeders for the birds.

Figure 28 - Stella Lamaze sharing her dialogue on what is important to her and her family though her art and words.

Figure 29 - The children working alongside a parent to care for the environment and make a new bug garden.

Figure 30 - Michelangelo practicing caring for his friend K as she visits the reserve with the group as a young toddler.

Figure 31 - Sage making her caring cape. She designed, sewed and wore the cape with pride.

Figure 32 - Reaping the rewards of caring for the garden at the community gardens. Lizzy with a handful of carrots to take back to kindergarten.

"Reggio proposes to us a practice permeated with active participation and a reflective culture which values, but also problematizes, notions of democracy, dialogue and diversity, and which is open to the surrounding world and stands in communication with others" (Dahlberg, Moss, & Pence, 2007, p. 123). An ethic of care is grounded in the importance of everyone having agency and a voice, respectful responsive relationships and taking responsibilities while experiencing ourselves in relation to understanding others (Kentel & Noddings, 2011; Noddings, 2003). The children displaying agency and an ethic of care have been attending

this kindergarten for at least six months. Some have attended for 18 months or more, and are immersed within this kindergarten's ecosystem or culture of sustainable practices and care for the environment. The children show agency through being fully involved in their environment. Several children took on roles of responsibility daily at kindergarten and at home in maintaining and caring for their environment. This ranged from children ensuring that food scraps ended up in the worm farm or the compost bin, the autumn leaves were raked up and put on the compost pile, watering the garden, turning water taps off, collection of rubbish and ensuring that equipment was used properly. (Refer to figures 33- 35).

Figure 33 - Rose helping to maintain and care for her environment.

Figure 34 - The children helping Oliver in his goal to replace the broken wooden bug houses at the local reserve.

Figure 35 - Sue (teacher) and Sage ensuring the fairy garden is well cared for.

The children appear to have good reasons for assigning intrinsic worth or value to nature, and therefore have taken on a duty to act with care towards nature.

In Rose's profile book there is a learning story from Joyce (her teacher) sharing her comments on a picture she drew while visiting the local reserve:

Today Rose you were excited to come over with the children to the M Reserve. I noticed you spending a long time on the picnic mat, eating all your lunch. Once that was done, it was time to get down to business, checking out this new environment. You found a clipboard and carefully drew this picture. I met you on the path with D. We looked at your work and you confidently told me and D that it was a plan for you to "care for the garden, the plants and bugs and worms" (refer figure 36 and 37). As you worked on your drawing you are clearly thinking about what you already know about the natural world.

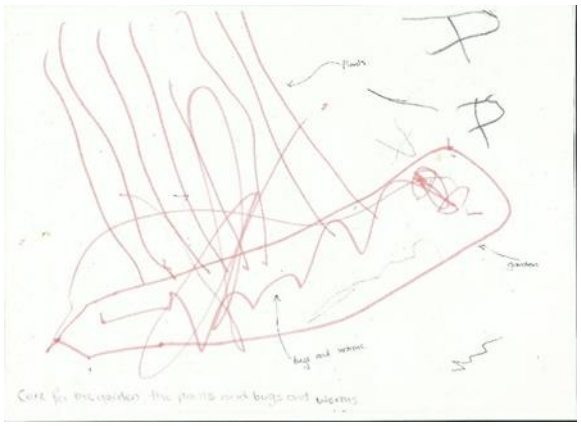

Figure 36 - Rose's plan on what to care for in the environment: plants, bugs and worms.

Clearly Rose is aware of different aspects of her environment and she confidently shared this information with others as well as her plan to care for her environment. Even though this was one of her first visits to the reserve she already had established a connection to this place and identified how she could contribute.

Figure 37 - Rose with her plan, as she explains her thoughts to Joyce (teacher).

For many children at the kindergarten the reason for valuing nature focuses on the Earth as the place where we live. They indicated we should not hurt the Earth or the creatures on it, that they love the Earth, and that the environment is important. Lewis, Mansfield and Baudains (2012) argue that there are essential components to formulating environmental values. These include "living harmoniously within ecological systems, developing a caring responsible attitude towards nature, and promoting a sense of continuity and community with other people and all living things" (p. 140).

Tinkerbelle experienced the harmony of living within an ecological system in her visit to the local reserve. Within this reserve there are stinging nettles to attract admiral butterflies, which Tinkerbelle had the pleasure of connecting with as one landed on her arm (refer figure 38).

Figure 38 - Tinkerbelle carefully watching the yellow admiral butterfly which landed on her arm at a visit to the reserve.

She also however connected with the nettle and learned the value of dock leaves to help reduce the sting (refer figure 39).

Figure 39 - Tinkerbelle learning the value of dock leaves after an encounter with stinging nettle.

To care there is a need to understand that we all (people, places and things) have a niche and are important to maintain harmony within an ecological system.

Figure 40 - Kila finishing her cape with a picture of her family and writing her words "Love the Earth".

Kila demonstrates a caring responsible attitude to nature when she expressed the following: “because this is our world and we care and live here. Write love the Earth on mine” (refer figure 40). Her words reflect a wider theme of care towards the environment that I observed and found in the data.

Care involves maintaining the world, and meeting the needs of ourselves and others. This can be seen here in figure 41, where this group of children responded to a friend in need.

Figure 41 - Joshua and friends fixing the leaking pipe problem in the sandpit.

Joshua called out "Help the pipe is broken and it's making everything dirty!" The children were exploring how to stop a leaky sewerage pipe, after the Canterbury earthquakes. When asked, Joshua explained his concern was that the sewerage will make the water and plants all dirty and that this was not good for anybody. Joshua showed concern for the effect this leaky pipe might have on the environment or his friends. Joshua and his friends are showing a sense of continuity and community with those around them. Caring, empathy, feeling with others, being sensitive to each other's feelings, all may be better guides to what humanity requires rather than intellectual rules of reason, or rational calculation. At the very least care will enrich our moral ethical reflection (Traer, 2009).

The act or intention to care is complex. Oliver showed a disconnection to the Earth with his interesting working theory about what should be cared for. He explained that we don't need to worry or care about the Earth because it is way up in the sky and we cannot see it.

Oliver:	Mmm [pause] we don't see it because it is up in the space.
Researcher:	So I am wondering because we don't see it, does that mean we should not care for it [Earth].
Oliver:	No it is in space so it does not need us.
Researcher:	So what should we care for, I wonder?
Oliver:	Mmm [pause] the things like us [pause] uhmm plants, dirt, and maybe bugs.
Researcher:	So you thinking about the things that live on the Earth in space are what we should care for, is that right?
Oliver:	Yes, because that is what we see. Because we can't see the planet because it is so high, it is [pause].
Liam:	Up in space.

Oliver's theory was that the earth is a planet and that what we need to care for is the things that are on the Earth (dirt, plants, animals, and people). The items on the Earth were more important and had value to him. He is not necessarily alone in this view.

Holmes cited in (Clayton & Opotow, 2003) argues in regards to place theory that

> For many people, broad terms such as "the nonhuman environment" or "ecological identity" are too general, too abstract to have any meaning in their lives. What really matters to most people is not "the planet' as a whole, but rather specific places - this home, this soil, this town, area, or region. (p. 29)

For Oliver a sense of grounding is essential to his individual environmental identity. There are many examples of children caring for the living creatures within their environment. This enables a specific, direct focus, grounded in the local. For example several children had noticed the monarch butterflies at kindergarten. Alex and Sage, who had several entries in their profile books as well as in the data recordings about the butterflies, showed their wonderment and awe of these delicate creatures. Here is one such encounter for both Alex and Sage.

Figure 42 - Alex and Lachlan noticing the butterfly in the butterfly house.

[Alex and Lachlan discovered another butterfly in the butterfly house (refer figure 42).]

Alex:	Can I take it to circle time.
Researcher:	Why do you need it to come with you Alex?
Alex:	I want to show the other children.
Researcher:	I think we might just have to tell the children about it as it is in the house and we can't get to it.
Alex:	Ah [pause] I can show them a picture.

Alex found a photo of a monarch in the bug photo pile and shared his finding with the group. Later Raceman and Sage (refer figure 43) noticed that the butterfly had flown out of the house and was sitting on the rosemary bush.

Figure 43 - Raceman and Sage in awe of the delicate butterfly.

Raceman:	Come look the butterfly is out!
Sage:	I wonder if that is the same one Alex saw.
Raceman:	I think so [pause] can I hold it?
Researcher:	Try and hold your hand close to see if it will climb onto your arm.
Sage:	Be careful!

[Raceman gently helped the butterfly onto his hand and both Sage and Raceman had a close up look at the butterfly.]

Sage had a strong sense of protection and care for these creatures. This is reinforced by an earlier observation where she expressed her sadness about the death of a butterfly and what needed to happen to ensure their safety. This care shows Sage's strong sense of responsibility for other living creatures. Alex took on a role of responsibility to care for and teach others about the butterflies and how to look after it. Overall, the children showed empathy towards the creatures in their care, often discussing the importance of their environmental needs, as was the case when Sage and Libby Eloise filled the birdfeeders. This empathy and understanding of environmental needs also came up in conversation when someone found worms or bugs in the garden. In this observation Charles and Sage advocate for the care of the worm that was found (refer figures 44 and 45).

Figure 44 - Sage, Alex and friends working on their new garden in the forest where they found several worms.

Figure 45 - Alex showing Charles, Sage and Hadsen the worm on the spade before returning it to the garden.

Sage:	Be careful J there is a worm there, see.
Researcher:	I noticed there are a lot of bugs and worms in this area, they must like it in the leaves and dirt here.
Alex:	Where are the worms?
Sage:	Here see.
Alex:	Can I have it?

Charles:	NO they live in the dirt!
Researcher:	That's true Charles, I wonder Alex, did you just want to have a look at it then you can put it back in its home?
Alex:	Yeah.
Researcher:	I'll carefully put it on your spade then you can show the others.
Charles:	Be careful J.

The children showed empathy and a sense of responsibility to keep this creature safe.

Similarly Fletcher showed concern for the worms, when he noticed Jack wanting to take them home with him after digging them up in the dig pit.

Fletcher:	Put them back.
Jack:	I can take them home.
Fletcher:	No put them back or put them with the worms.
Jack:	I want to take them. I have worms at home too.
Fletcher:	NO, they live here we can feed them here!
Jack:	I'll put dirt on them.
Fletcher:	No don't do that it will give them a headache.
Researcher:	Tell me why do you think that Fletcher?
Fletcher:	Because there are pebbles and it will hurt their brain.
Jack:	Worms like dirt [pause] they eat it.
Fletcher:	Put them back here.
Jack:	Here is a good place.

Fletcher (seen here in figure 46) had strong feelings about what it meant to care for the worm and how to keep it safe, and confidently shared this with Jack to ensure the safety of the worm.

Figure 46 - Fletcher digging in the garden where they found the worms.

Oliver showed similar strong feelings with the comment “that makes me angry!” when he noticed that the wooden log at the local reserve was all broken up. Oliver knew bugs lived in the log and he was trying to put the wooden pieces back together again.

Children’s perception or beliefs are not developed through a process of passive absorption, but through active construction (Traer, 2009). The children are making sense of what they value through these experiences and the relationships they are building with and within their environment. What they believe about the world depends on what they know. For the children their duty is simply to do what is rational - acting on what seems to be their conscience. Meaning, they acted rationally with good intentions. For example when Lachlan was asked if anyone made him pick up rubbish on his way home he replied with the following statement: “no I just see one, and take it to you because that’s thinking of the environment.” For these children it just is the right thing to do.

This kindergarten is a place of culture; it is a place where the children's personal and collective culture is developed. This culture influences the social and values context and in turn, is influenced by this context in a relationship of deep and authentic reciprocity (Rinaldi, 2001). Being a caring and good friend is very important to these children. It is the golden rule of "Do to others, as you would have them do to you" [13] in action. For example, there were several observations of children building tall constructions (refer figure 47).

Figure 47 - One of many tall constructions that the children made. These constructions often stayed up for over a week, as children showed respect and care for their peers' work, and were encouraged to add to each other's work.

These constructions stayed up for several days, and children encouraged each other to take care of their work, keep it up and add more to the work. The children are also acknowledging and showing an understanding that their actions affect others and can result in a better future for others, as seen here in the conversation with George.

Researcher:	If we are caring for the environment now, who are we [pause] why should we do this George?
George:	Ahhh [pause] so when others come it is always nice.
Researcher:	Who will come here? Do you mean after you go to school or what do you mean when others come?
George:	D, he will come when I am at school. [D is George's youngest brother]
Researcher:	D, so that's quite important to you that he's got a nice place to come to?

[13]Golden rule… Moral arguments (Kohlberg, 1971).

George:	Yes.
Researcher:	And when he is a kindy boy will he also have the same job as you to look after the environment?
George:	Yes so it always stays nice.

George values the environment and shows a greater understanding of the long term effects he has on his environment. Similarly in the following observation, Jonny and Olivia both commented that it was their duty to care for their environment to ensure their younger siblings had a nice kindergarten to attend after they have left.

Researcher:	Why is it our job to look after kindy?
Jonny:	Uhhm, so, so things don't get wrong.
Researcher:	So things don't get wrong, and I'm wondering why should we not have things get wrong?
Jonny:	Because we don't like it, and I like kindy and K will like kindy.
Michelangelo:	Who's K?
Researcher:	K is your little sister isn't it.
Jonny:	[laughs] Yeah!
Researcher:	So you're looking after it for K when she comes to kindy.
Jonny:	Yes, and for me.
Researcher:	Yeah, that's awesome Jonny!
Olivia:	Yeah and when my baby brother comes.
Jonny:	If me and K came to kindy and she did not look after kindy I wouldn't, I wouldn't have a nice kindy would I?
Researcher:	No, and that's your job isn't it.
Jonny:	Yes if she did that to this kindy I would have to go to another Kindy.

A key aspect of sustainability is about reducing our impact for future generations. These observations show that Jonny, Olivia and George have an intergenerational understanding, and recognise the importance of maintaining our environment for the future.

Gilligan (2011) argues that by nature we are empathetic and responsive beings and that the question should not be how do people become empathetic and responsive to others but how do we lose the capacity for empathy and mutual understanding. I agree with this statement when looking at the research. The data shows that the children's understanding of their role

as guardians of the Earth are based around their caring experiences of people, places and thing. The children enact strong themes of empathy, care and responsiveness towards their living environment and each other, similar to the sense of responsibility the Lorax had for the trees and creatures in Dr. Seuss' children's book (refer figure 48).

Figure 48 - Alex pretending to be the 'Lorax' on one of his visits to the local reserve.

Caring is a foundation for our sense of justice and builds the children's understanding that everyday actions influence others. It is about being grateful, and cherishing what enriches our lives- it is almost as important as the air that we breathe and having a right to be active citizens.

4.2.3 'Atmosphere' - Give a Little Air

Atmosphere provides oxygen and carbon dioxide. Without the complex interactions and elements within the atmosphere, there would be no life at all (Nature Works, 2014). Similarly the concept of the child as rights holder and active citizen can be seen as the

oxygen that allows education for sustainability to live. This relates to the tenet that the child is a rights holder who actively participates and contributes to society's present and future. They are more than just passive passengers. In this research the data showed that the children's rights were respected and their participation was encouraged. This was seen as the 'oxygen' that kept this kindergarten's sustainable programme and education for sustainability alive. This 'oxygen' potentially prompted the children's perspectives on their role as guardians of the Earth. Throughout the data the children shared their critical thinking, shared meaning making and working theories about caring for the Earth.

Samuelsson and Kaga (2008) have shown that when children's perspectives and meanings are listened to and considered it can and should shape the content and approaches of learning. For example Raceman, in taking the lead to teach his friends about the use and practices for worm juice, shows that he is confident and comfortable enough to take charge and teach others (refer figure 49- 51).

Figure 49 - Raceman taking the leadership role in diluting the worm juice so they can use it in the garden.

Figure 50 - Fletcher feeding the food scraps to the worms.

Figure 51 - Using the worm juice on the garden.

Fletcher:	I am the worm monitor. I'll feed the worms all the banana skins, look.
Researcher:	Do you need help lifting the lid?
Fletcher:	I can do it.
Ryan:	I can help…
Researcher:	Wow, look at all the worm juice in the white bucket.
Fletcher:	Can we use it?
Researcher:	What would you use it for?
Raceman:	You put it on the plants but we need water.
Researcher:	What is the water for?
Raceman:	We mix it with the worm juice so we can water the garden.
Researcher:	So you need to dilute the worm juice before we put it on the garden?
Raceman:	Yes, we need a bucket.
Researcher:	Ok, let's get the hose and another bucket.
Raceman:	I can show you.
Fletcher:	I want to do it too.
Raceman:	We will need water cans.
Fletcher:	Yeah, I want a blue one.

Raceman confidently took the lead, showed prior knowledge and previous participation which enabled him to support his peers. Within this kindergarten there is a culture of sharing ideas, and the children are encouraged to participate and be active in the whole process including teaching and sharing ideas with each other.

Figure 52 - Lachlan helping to rake up the leaves.

Figure 53 - Tinkerbelle raking the leaves from the deck.

Figure 54 - Team work to get over the hill to put the leaves by Archiebarchie's feet.

At this kindergarten authentic, purposeful experiences are offered and active participation is encouraged. The children are enabled to take charge of the practices within the kindergarten environment, for example raking up the autumn leaves. This is possible as the teachers have made the tools they need readily available for the children to use, and empowered them to take action. The children, especially Lachlan, Stella Lamaze, Michelangelo and Tinkerbelle, saw this role as very important and a way to take action to care for and maintain their environment (refer figures 52- 55).

Researcher:	Why are you choosing to do this job, Lachlan?
Lachlan:	We don't like our kindy dirty.
Researcher:	What are you doing with the leaves?
Stella Lamaze:	We are putting them at Archiebarchie's feet [*Archiebarchie is a scarecrow*].

Tinkerbelle:	Yeah, Rosie thought he could look after it.
Researcher:	What will happen to leaves there?
Lachlan:	We are making compost.
Researcher:	What will we use the compost for?
Stella Lamaze:	For the dirt.
Tinkerbelle:	I like this job.
Researcher:	Why Tinkerbelle?
Tinkerbelle:	I like using the rake and getting all the leaves in a pile, then we can play with it!
Lachlan:	No, we put it on the trolleys.
Tinkerbelle:	And play with it!
Researcher:	I like how you are using the rakes as tongs Michelangelo!
Michelangelo:	Yeah I am the picker upper!
Researcher:	It looks like you are picking up salad!
Michelangelo:	My mum has big forks for the salad!
	[We all laugh]
Researcher:	Thanks for taking responsibility for this job, team.
Michelangelo:	You're welcome!

Figure 55 – a) Michelangelo showing how he picks up the leaves with the rakes, b) and how he drops the leaves in the trolley.

The children in this group were aware of the need for cleaning up the leaves, had the tools available and showed a sense of duty. Taking responsibility within their environment was still fun however, particularly for Tinkerbelle. The children showed a sense of value for their environment and cared enough to take action. There was camaraderie and unity (kotahitanga) amongst this group as they all worked towards their common goal of caring for and cleaning up that space. This was also not their first experience of this activity as they confidently articulated the process and used prior knowledge of using the leaves to make compost. The children noticed needs within the environment and took action, just like Courtney in this observation (refer figure 56).

Courtney: I need to water the sunflowers [seeds].
Researcher: Sure what can I do to help you?
Courtney: Can you get me a water can.
Researcher: Sure can, they are just here Courtney. Why do you think you need to water the sunflowers?
Courtney: They need water, look.
Researcher: I think you're right they look dry to me too, thanks Courtney.
Courtney: You're welcome.
[Courtney filled the watering can and carefully started to water the pots of sunflower seeds.]

Figure 56 - Courtney watering the sunflower seeds.

Courtney observed the need and had knowledge about plants to know what her action needed to be. Courtney trusted the adults in her environment to support her in her action of being a guardian (kaitiakitanga) for the plants.

Relationships in early childhood are a key contributor to children feeling empowered, which relates back to the flow of air needed to keep this ecosystem healthy. It is important for children to develop an emotional bond to nature and an ethic of caring and respect for the natural world if they are to practice environmental sustainability as adults (Herbert, 2008). These relationships can be between peers or with teachers or family. Like Sage and Tinkerbell in their role as monitors, Raceman knew that his observations and actions would be acknowledged.

Figure 57 - Raceman being the water monitor at kindergarten.

He felt comfortable he could take action to solve a problem he noticed at kindergarten. He showed confidence in his actions and was able to share his ideas on the importance of the role he took during this situation (refer figure 57).

Researcher:	I'm wondering what made you come find me to say turn the tap off.
Raceman:	I did not want to waste water.
Researcher:	Yeah and that was the main reason. You did not want the water wasted, so what did you do?
Raceman:	I did not want a water flood.
Researcher:	No, so what did you do to stop the water from flooding?
Raceman:	I turned it off.
Researcher:	You went and turned off the tap, and that was good caring for the environment there Mr Raceman.
Alex:	Raceman left the tap running.
Researcher:	No Raceman did not leave the tap running Alex. He turned it off when he saw someone left the tap running.
Alex:	Yes.
Researcher:	So he came out and said "oh no someone left the tap running" and then turned it off.
Alex:	Oh yes that's good.
Researcher:	He was being the water monitor I'm thinking.
Raceman:	Yeah, J.

Here Raceman recalls the event and gains acknowledgement from his peer Alex for taking action in his environment. Alex shows his appreciation for the role Raceman took in this situation, as well as his duty as guardian (kaitiakitanga) in this environment.

Similarly Belle and Stella Lamaze also display a 'can do' attitude when they took on the responsibility of writing a letter to accompany the money the group raised for the World Wildlife Fund's (WWF) save the kiwis fundraising drive.

Stella Lamaze:	I'll write a letter.
Belle:	Can I help.
Researcher:	That would be great thanks Stella Lamaze and Belle. We need a letter to go with the money. What shall we write to the WWF?
Stella Lamaze:	Thank you for looking after the kiwis.
Researcher:	That's a good start. So we know how they are going to look after the kiwis?
Belle:	Ummm no.
Researcher:	So maybe we could ask them how they will be using our money to help care for the kiwis.
Stella Lamaze:	Yes.
Belle:	Yes I can help.

Together Stella Lamaze and Belle (refer figures 58 and 59) worked on wording a letter which they then wrote. Stella Lamaze and Belle then decided to decorate the pages. The letters got sent to the WWF with the children's donation. The children got a reply from the WWF with the receipt which was shared with the group at circle time.

Figure 58 - Stella Lamaze and Belle working on the letters for WWF.

Figure 59 - Belle proudly sharing her letter before mailing it.

Both Stella Lamaze and Belle had confidence in their abilities to write this letter which represented the kindergarten, and explored the power of collective action.

The children are able to make sense of their world and explore their ideas because they are in an environment where they are valued contributors. Rubbish collection is a good example of something that can be perceived in society as a small contribution in the scheme of all our environmental problems. Yet for these children it is so important and one of the main forms of action they take for the environment. This is because of their understanding of the local danger it could cause as well as the immediate results they see when they have done the job. They can see and acknowledge the change they facilitated instantly. Several of the children, including Lachlan, Tinkerbelle, Sage, and George, agree that cleaning up the environment is a shared role of responsibility and we all need to do our share.

Stella Lamaze in another scenario had a slightly different view on who should be taking responsibility.

Stella Lamaze:	Clean up.
Researcher:	That's why we clean it up isn't it, because we would not like to live in a place that's got lots…
Ellie:	What if it is already clean?
Researcher:	Yeah but who do you think should have that job of cleaning it up?
Stella Lamaze:	The people who made it.
Researcher:	Mmm the people who made the mess do you think.

Stella Lamaze thought that the people who caused the mess should be held responsible and accountable. Early childhood approaches have long been oriented towards the development of equitable, democratic, and inclusive ways for children and adults to interact. Social justice education has contributed a deeper awareness and curiosity about the world and the relationships between people (Freire, 2001). Stella Lamaze in her thinking is contemplating what is equitable and right.

The children at this kindergarten are part of a community of critical thinkers who are able to investigate and take informed actions. Stella Lamaze, George and Lachlan are all developing a desire to act critically on their knowledge gained, and see themselves as 'people with agency'. Children's rights do certainly begin in small places close to home (Polakow, 2010). Dahlberg and Moss (2005) argue that global citizenship is about the commitment to justice and wellbeing for all, in the neighbourhood as well as on the global scale. It is about the interrelation between 'self' and 'other' in local and global contexts. The children breathe life into their understandings of being agents of change through being leaders, a sense of duty, collective action and having confidence to act. This is all supported by the adults and

kindergarten culture to think critically. This critical thinking is essential for education for sustainability to be effective. Like water, without it, an ecosystem cannot survive.

4.2.4 'H_2O' - Water Everywhere

A large percentage of all living organisms is water. It acts as a carrier and distributor of nutrients necessary for survival (Nature Works, 2014). This can be related to critical thinking within education for sustainability. For education for sustainability to be successful, people are required to think critically about things that are typically taken for granted, and to find, carry out and distribute creative solutions and alternatives to unsustainable habits and practices (Samuelsson & Kaga, 2008). The children showed that they can be creative in their thinking to come up with solution or alternatives to challenges the community is currently facing. This related to the importance of 'water' within our ecosystem. Just as water is the distributor of nutrients, similarly critical thinking is essential for education for sustainability to ensure changes happen within a community.

One such example is Jack who comes up with a plan to design a robot to do the work of cleaning up the rubbish during a group conversation with his friends.

Jack:	If it was a dead Earth.
Rosie:	What would make it dead?
Jack:	If there was rubbish everywhere.
Rosie:	Rubbish everywhere.
Jack:	Yeah.
Researcher:	So is that maybe a job that we do. We pick up all the rubbish.
Jack:	No, no there has needs to be uhmm [pause] uhmmm, there has to be a robot that actually cleans up rubbish
Rosie:	Not people?
Jack:	There will be too much rubbish.

Researcher:	Jack what kind of robot picks up all the rubbish?
Jack:	Uhm [pause] Wally could be the name of the robot and he would clean, uhm, the rubbish for 100 years.
Rosie:	That's long isn't it?
Jack:	Yes.
Researcher:	So if we invent a robot that picks up all the rubbish, would the people have to do it?
Jack:	No, only the robot.
Researcher:	So what will the people do?
Jack:	They just have to live and live for a very long time until it becomes alive Earth.
Researcher:	Until the Earth becomes alive again, how will that happen? How will the Earth become alive again?
Jack:	If all of the rubbish gets picked up by Wally.

Jack and Rosie discussed their knowledge of caring for the Earth and the theories they have around keeping the Earth alive. Jack has inventive ideas (possibly influenced by a movie about a robot, which I learned later of through a conversation with a parent) on how to create a tool that would help solve the issue of too much rubbish and a dead Earth. Jack and Rosie are both creating theories about time and how long this colossal task might take and what this might mean for the people that live on the Earth. At this kindergarten, critical thinking and exploration are strongly encouraged and builds on what the children bring to the kindergarten community as seen here during a group discussion on how to clean up the environment.

Joyce:	But what would those people who are putting the rubbish on the ground in the first place what could they do instead?
Tinkerbelle:	Put it in the bin.
Michelangelo:	No when they forget where's the bin they [pause] they might hold on to it and put it in their lunch boxes, they might go home with it.
Rosie:	So take them home. I am wondering when we sing about our care code we sing about our lunch boxes…
Jack:	Wrap free…
Michelangelo:	So maybe we can teach people about having a wrap free lunch box.
Researcher:	How can we do that?
Tinkerbelle:	We could tell them.
Researcher:	Tell them [pause] what else can we do?...
Sage:	Show them.
Researcher:	What else can we use?

Amber:	Our words.
Researcher:	Write it in words Amber?
Amber:	Make a sign (refer figure 60)…
Amber:	Uhm [pause] it will look like lunch boxes open with no wrappers on the inside, with no wrappers on.
Rosie:	So a picture…
Ellie:	And you can make a big hand.
Researcher:	You can make what sorry Ellie?
Ellie:	You can make a hand so people wrapping it free…
Tinkerbelle:	It will go like that [Actions, put her hand up and then draw a line through the air with her finger to cross over her hand] and that means stop!
Researcher:	So stop no wrappers.
Tinkerbelle:	Yeah.

Figure 60 - Ellie and Smiley Face working together to make the signs to teach the school children to be wrapping free.

This conversation displays children critically thinking about the way they might communicate and share their message with the school children to reach their goal of reducing rubbish in the environment. Here the child is constructing knowledge, not being taught an existing body of knowledge. The children are experiencing that producing knowledge and making meaning is done in relationship with other co-constructors, both adults and children. Here the young child's ideas and theories are taken seriously, and the adults are ready to confront and challenge them to ensure they critically reflect on the world and the practices around them. This discourse of meaning making therefore not only embraces a social

constructivist standpoint, but relates to an understanding of learning as a process of co-construction, by which in relationship with others we make meaning of the world (Dahlberg et al., 2007).

This is also evident through the tikanga principle of ako that describes a teaching and learning relationship. Here the educator is also learning from the student and shared opportunities for all teaching and learning takes place (Williams, Broadley & Te-Aho, 2012). This theme compliments the concept of guardianship and taking action within this kindergarten community. For example, Michelangelo inspired his peers at kindergarten to think of ways to teach and support the school in being 'wrap free' in their lunch boxes and to reduce the rubbish in their playground. The children discussed their ideas on why this initiative was important and why they needed to take action.

Rosie:	Right, if there were NO rubbish, if there were No rubbish at all.
Jack:	Then Papatuanuku WILL like it!
Researcher:	I think so too Jack.
Rosie:	Would you like to be covered in plastic? And Rubbish? [Several children calling out NO.]
Sage:	That will be stinky.
Rosie:	And that is why I'm thinking pour old Papatuanuku does not like that either.
Sage:	Cause…
Rosie:	Cause what …
Sage:	No one likes going in the rubbish bins because it gets really stinky.

The children were aware of the health dangers and the effect the rubbish had on the environment and understood the importance of cleaning the environment up. The children discussed several ideas on how to teach the school children, sharing their working theories on what strategies they perceived were powerful in getting their message across. The power of a

sign to teach others were put at the top of the list of suggestions as well as making a song that they could sing to the school children as seen in figure 61.

> School kids, school kids, don't drop rubbish! School kids, school kids, put it in the bin! School kids, school kids, don't drop apple skins on the ground! School kids, school kids… always be 'wrap free'!

Figure 61 - Singing the wrap free song to the school children at assembly.

The children delivered this message to the school children during one of the school assemblies, where they displayed the signs they collectively made.

Figure 62 - On the way to the assembly to share the message of having wrap free lunches.

Figure 63 - Michelangelo taking the microphone to address the school at assembly, along with the support from his peers and teachers.

The signs were created after several group discussions on what the signs should say, and show to help the school children understand what a 'wrap free' lunch could look like. Michelangelo led the group during this presentation and delivered the group's key message to the school children (refer figures 62 and 63), with confidence and courage, while wearing a

red cape. The children had an understanding of what needed to be said to their school peers and felt empowered to take action. The children behaved as active and reflective citizens. They were thoughtful and considerate yet assertive, speaking up for themselves and for others.

Davis (2010b) views education for sustainability as a 'frame of mind' that requires a deep understanding of ourselves, our neighbours, our societal and cultural processes and how we are connected. During a conversation I had with Michelangelo about his ideas on teaching the school children he commented the following;

Researcher:	Do you know what I'm really impressed about Michelangelo, is all your ideas about how we could teach the school kids about being conservationist and putting their rubbish in the bin, and even not have rubbish by having wrap free lunch boxes.
Michelangelo:	I could be the king of rubbish, couldn't I?
Researcher:	You could be the king of rubbish, you could be the king of rubbish collection, and making sure you tell everyone. We could make you a crown.
Michelangelo:	Yip!
Ellie:	And on the crown it could have pictures of rubbish.
Researcher:	It could, it could have all sorts of rubbish.
Michelangelo:	And a bin!
Researcher:	A bit like Michael Recycle?
Rose:	I could make pictures of rubbish.

Michelangelo has strong connections with his community and is building working theories and understandings about the importance of teaching others about rubbish collection, because what has a higher standing than a king or a superhero wearing a cape saving the world. It was important to Michelangelo that he wore his red cape at assembly to share the kindergarten children's message, and following this experience he went on to make a special cape with the words "Kaitiaki taonga a papatuanuku' - conservationist (refer figure 64).

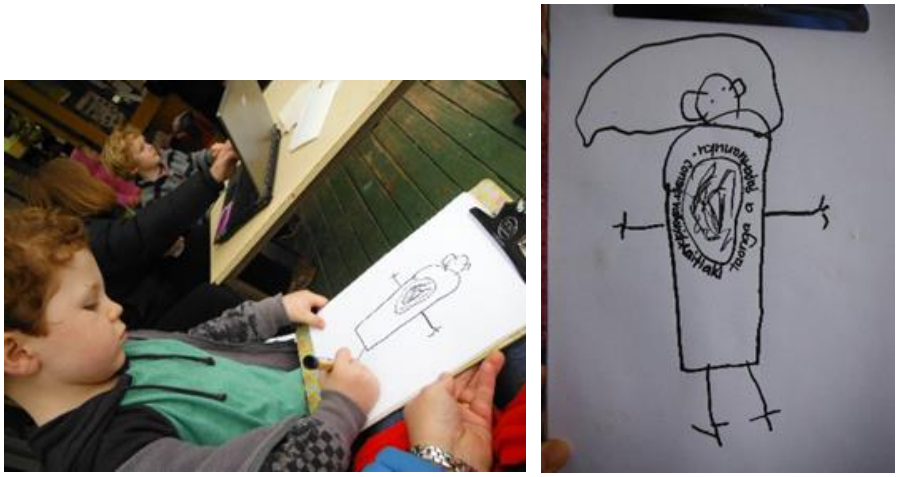

Figure 64- a) Michelangelo designing his cape, b) the final drawing before he got busy making it.

Michelangelo:	Well I think it needs to be big like this, [draws a rectangle shape] and then in the middle it needs to have the Earth because that's what we do.
Researcher:	What do we do?
Sage:	We look after it.
Michelangelo:	Yeah like those Māori words Rosie told us.
Researcher:	Are you thinking about Kaitiaki taonga a Papatuanuku, being conservationists?
Michelangelo:	Yeah that words.
Researcher:	So where would you put the words?
Michelangelo:	Around the Earth, can you write them please?
Researcher:	Sure would you like me to start here and go around.
Michelangelo:	Yes here then Sage can do hers.

Michelangelo has confidence in his ideas, and shows how important this role of conservationist is to him. This action of agency also inspired his peers Sage, Kila, Leaf, Alex, Jack and Jonny to make similar capes to share their messages of caring for the environment.

Researcher:	So how will we make these capes?
Sage:	We can sew it.
Researcher:	We could, we will need to see if we have material to make them then.
Sage:	Yeah, I want mine to have the sun on it.
Researcher:	Why the sun Sage?
Sage:	Because we care for the sun.
Researcher:	How do we care for the sun?
Sage:	We need the sun to help the plants grow. I want words too.
Researcher:	What would you like your cape to say to people?

Sage: Care for the Earth.

For both Sage and Michelangelo (and later Alex, Jonny, Jack, Kila and Leaf) there is the working theory that in order to save the Earth, one must wear a cape (refer figures 65- 70).

Figure 65 - Sage sewing her cape.

Figure 66 - Michelangelo putting the finishing touches on his cape.

Figure 67 - Kila and Sage wearing their capes with pride.

Figure 68 - Carolkey with her 'Care for the birds' cape she made.

Figure 69 - Michelangelo wearing his cape while working at kindergarten.

Figure 70 - Leaf with his cape to care for the trees.

The value or importance they place on this role is comparable to that given to a super hero, and as discussed above when Michelangelo expressed that he was the 'king of rubbish'.

Rosie had her own working theory in what the role of guardians of the Earth entails. Rosie related her thinking to her knowledge of the 'Care Bears' and that each bear has a special caring role, and therefore so do we all have a specific role to care for our environment and each other. The children's understanding of their role as guardians of the Earth are fed by their critical thinking and working theories on how to effect change. The understanding of being a super hero puts them in a position of responsibility and bestows power to take action. The children showed pride, ambition and a desire to be a guardian of the Earth like the Lorax in the Dr. Seuss children's book. These kindergarten children's actions showed that they are competent, capable and confident to speak for the environment.

4.3 Conclusion

Ecosystems embody the concept that living organisms continually interact with each other and with the environment to produce complex systems with emergent properties (i.e. communities are stronger than just their parts and pieces). Through education for sustainability the children's actions, interactions and discussions reflects these complex relationships between elements, and create strong communities where children function as guardians of the Earth. What started as a humble metaphor to help me understand the children's actions in relation to being guardians and agents of change, has become a useful tool to explore the data. The children's actions and understandings of their role as guardians of the Earth highlighted the level of importance the children gave to this role within the kindergarten environment.

The children connect and are responsive to this place, and places shape us just as we shape places, we are all part of the environment. Place breathes life and a sense of wonder into our beings (Wilson, 1996). The children at the heart of this research know and relate to the Earth as a vale of soul-making - mauri. Because of this the children are capable of enhancement of human experience and a healthier relationship with the natural environment. The kindergarten children have been in an environment where their capacity to be active agents of change, have been recognised and supported.

Education for sustainability involves children, teachers and communities working collectively and dramatically towards the resolution of environmental questions, issues, and problems. It is a holistic approach to develop ethical relationships between people, places and things,

plants and animals (Duhn et al., 2010). It is about values, attitudes, ethics, and actions. It is not a subject, not an "add on." Neither can it be an option. It is a way of thinking and a way of practice and 'UNLESS' children value their environment, then nothing will change, not even one bit.

Chapter 5: Community (Hapori)

"Mister!" he said with a sawdusty sneeze, "I am the Lorax, I speak for the trees. I speak for the trees, for the trees have no tongues. And I'm asking you, sir, at the top of my lungs"

~ Dr. Seuss[14]

5.1 Introduction

An ecosystem consists of parts and pieces, as focused on in the previous findings chapter. However it is how these pieces come together that creates the community and harmony within an ecosystem. This findings chapter builds on from the previous chapter through a focus on community (hapori) in order to show how the children enact, understand and value their role as guardians of the Earth.

I firstly discuss the evidence of the children's understandings that the role of guardian is a responsibility shared by all, looking at the ecological attribute of connectedness (hononga) or the idea that 'we are all in this together'. Secondly, I examine the children's multiple interactions (taunekeneke) with the environment and how they co-construct their perspectives on the role of guardian. This relates to the ecological characteristic of diversity or 'the more the merrier'. Thirdly, exploring the data showing the ecological characteristic of unity (kotahitanga), which relates to the flow of energy or 'getting along' as the children share the actions they take in the role of guardian and the value they place on this. Although the Lorax

[14] From '*The Lorax*' (Seuss, 2006, p. 23)

had to speak for the trees, it is clear that the children can and will speak for themselves and for the environment, as discussed in the following sections.

5.1.1 Connectedness (Hononga) - 'We are all in this together'

Within an ecosystem, everything is connected. It is a community of living and non-living elements or parts and pieces that work together, and it is essential that all the parts work together to make a balanced system (Ellis, 2011; Nature Works, 2014). Analysis of the data suggests that the children value the concept of 'we are all in this together'. The children display an understanding that their actions can cause a reaction. They understand that being a guardian of the Earth is not just an individual role, but one that is shared and everyone needs to play their part. A conversation with Lachlan demonstrates this:

Lachlan:	I pick up the rubbish!
Researcher:	Yes, that is exactly what I have seen. I wonder why you pick up the rubbish.
Lachlan:	Uhm [pause].
Researcher:	Does anyone tell or ask you to do it?
Lachlan:	No [pause] I just see one, and I take it to you because thinking of the environment. [They normally pass the rubbish through the window of the kindergarten.]
Researcher:	So you are just doing it because you want to care for the environment. What makes you do it? Why do you think we should care for the environment?
Lachlan:	[Pause] Because it's what we do because that's our job.
Researcher:	You know that is so great you told me that because I was wondering whose job it is, but you just told me that it is your job. Do other people need to help you?
Lachlan:	Ah yep, Isabelle.
Researcher:	Isabelle helps. Anybody else?
Lachlan:	And all my friends.

Lachlan clearly shows he understands that a mutual effort is needed, and he identifies who else has a role to play in caring for the environment; Isabelle and 'all my friends'. There is a

dependence on each other to play a part for the greater good, similar to the dependence of elements within a healthy ecosystem.

A similar conversation with George reveals the perspective that a whole team approach is needed to ensure the environment remains in the best possible condition.

Researcher:	Now George, what I wanted to talk to you about was the environment, and the first thing I would like to know is do you think we should look after the environment?
George:	Yip.
Researcher:	Yip, why do you think we should?
George:	So it doesn't get messy.
Researcher:	So it doesn't get messy. Why don't we want a messy environment?
George:	Because then it won't look good.
Researcher:	Because it won't look good and do you think we would like living in a messy environment?
George:	Nah.
Researcher:	So whose job do you think it is to tidy up the environment?
George:	All of us.
Researcher:	All of our jobs, we have the responsibility to do it.
George:	Yip.

George believes that we all have a responsibility to keep a tidy environment, for today but also for the future when his brother attends kindergarten, as discussed in the previous chapter.

Both Lachlan and George showed a sense of duty to help care and maintain the environment and knew they would gain acknowledgement from the adults at kindergarten. They had built an environmental identity within this place and are passionate about their environment. Clayton and Opotow (2003) describe identities as social roles, and roles entail responsibilities.

> An environmental identity – how we orient ourselves to the natural world - can describe the way in which abstract global issues become immediate and personal for an individual. An environmental identity also prescribes a course of action that is compatible with individual's sense of who they are. (p. 2)

Lachlan and George, as mentioned, are showing environmentally sustainable behaviour because of a strong community identity. Both personal and collective identity helps determine whether the values of sustainability are adopted.

Similarly children's learning processes are shaped by the particular contexts in which they take place, where individual cognitive development cannot be separated from interpersonal and community processes within a socio-cultural perspective (Smith, Cowie, & Blades, 2003). Within this early childhood environment the children are viewed as co-constructers of knowledge and adults are seen as co-learners (Ritchie, 2010a). This in turn relates to the tikanga concept of ako as children and adults are all learning and working together. The teachers in this research are influenced by Malaguzzi in their perspective of children. They perceive children as rich in potential, resilient, powerful, competent and most of all connected to adults, other children and their environment (Malaguzzi, cited in Dahlberg et al., 2007). This too reflects the socio-cultural approach to pedagogy established in child-centred early childhood curricula, such as *Te Whāriki* in Aotearoa New Zealand (Ministry of Education, 1996).

In this research, the children take an active role in the kindergarten programme through taking on different roles of responsibility within the socio-cultural environment. The children are involved in decision making about the kindergarten programme, as well as the action they take within the kindergarten environment and the wider community. The children influenced the teacher's actions, motivated their families' actions, and expanded environmental

understandings with their peers. Here Alex's mum shares how his actions have changed their family's practices.

> We always have rubbish in the car, because when we are out and about and there is any rubbish lying around, Alex always makes us pick it up. So now we have a bucket in the car so he has somewhere to put it. I think it is great, and having a bucket is just a small way I can help him.

Alex has inspired a change in his family's actions, and made them aware of the need to take action within their community. This is an example of how Rogoff and her colleagues (Rogoff et al., 2007) perceive the socio-cultural context of individual development. They suggest that individual development is inseparable from interpersonal and community processes, and that individuals' changing roles are reciprocally defined with those of other people and with dynamic cultural processes.

In essence a 'community of practice'[15] (Wenger, 1998) has been created. This involves much more than the skill associated with undertaking a task, rather the children are involved in a set of relationships and interactions, concerning things that matter to them. This community of practice functions because it has produced and adopted a shared repertoire of ideas, practices and commitments. The children are involved in practices and approaches that are shared to a significant extent among all the children and members of this community (Wenger, 1998). It is essential for the survival of an ecosystem that the living and non-living parts and pieces work together. This can be seen in Alex's influence on his mum's actions and how they have created a culture within their family to take action within their community.

[15] A community of practice is a group of people who share a concern or a passion for something they do, and learn how to do it better as they interact regularly (Wenger, 1998).

Within a community of practice, Vaealiki and Mackey (2008) have shown that children can influence teachers' and adults' actions through strengthening children's competency to take action. This is achieved through an environment that empowers collaboration and the involvement of teachers, parents and children in decisions, practices and actions for the environment. By empowering collaboration, children can be said to have agency (Dahlberg et al., 2007). This kindergarten has established a transformative teaching and learning approach (Ritchie, 2010a) with systems and strategies that encourage and support children to be active citizens with responsibility. This approach potentially influenced the children's perspective on the role of guardian of the Earth. The children are active participants within the programme and routines of the kindergarten. Tinkerbelle gained a sense of agency and confidence in her actions through experiences within her environment that she announced at one of the clean-up trips that: "When I go to school I will teach the other children how to pick up their rubbish."

Clearly Tinkerbelle is confident that she can take action within her community and encourage change in other people's behaviours. What is also significant here is that Tinkerbelle wants to take action and teach others the value of their environment and keeping it healthy. This reflects the *Te Whāriki* principle of empowerment (Whakamana) (Ministry of Education, 1996) where the children are empowered to make a difference, be independent and make decisions about and for the future. Tinkerbelle is empowered to find her niche by developing a love and responsibility for looking after the environment and looking forward for the wellbeing of the environment when she is at school.

Taking action is a strong theme throughout the data that shows stewardship or guardianship (kaitiakitanga) and the children's actions in and for the environment. Rogoff et al. (2007) state that participation in sustainable, everyday activities, where learning is understood as collaborative and intentional, enhances a sense of community. At the kindergarten, one such strategy is where the children take on monitor roles. The monitor system was created out of a child's interest to be responsible for the worm farm. This child created a badge to show they were in charge of the worms. The action of being "in charge" led to the children taking control and responsibility for their actions, and an aspect of the environment. This also led to them supporting their peers within other areas at the kindergarten. The monitors were established through discussions with the children on what they deemed were roles of responsibility. Often these were revisited in light of new changing roles or responsibilities. At the time of this research the kindergarten had several monitor roles:

1. Water monitors who reminded and encouraged their peers to conserve water and turn taps off;
2. Worm monitors who collected the food scraps from morning tea and lunch to feed the worms as well as checked the level of worm juice to help feed the plants;
3. Fish monitors who fed the fish and also checked the tank cleanliness;
4. Bird monitors who fed the bird and also checked the cage cleanliness;
5. Frog monitors who caught food for the frog and kept an eye on his habitat;
6. Recycling monitors who got the recycling ready for collection day;
7. Garden monitors who watered and maintained the gardens; and
8. Rubbish monitors who ensured the rubbish was in the right bins.

Figure 71 -The monitor badges.

On a daily basis, the children chose which roles or responsibilities they wanted to be involved with. There are monitor badges (refer figure 71) which the children created and they wear these during the day to indicate the role or responsibility they are taking. This aspect of the programme is not compulsory, it is a child's choice to participate. The teachers focus the children's attention on these roles at times, reintroducing the tasks to new children and encouraging opportunities for tuakana/teina relationships to thrive and develop as children and teachers work alongside more experienced peers (Rogoff, 2003; Rogoff et al., 2007).

Learning from others is a key aspect in a community of practice. Wenger (1998) suggests that regular interaction enables the transfer of knowledge and improvement. A conversation heard by a teacher while observing a group of children in the sandpit supports the idea that the children are the experts within their environment and they can share their knowledge with their peers. As shown in figure 72 and the learning story by the teacher, the children share their knowledge on water conservation.

Figure 72 - a) Raceman explaining the importance of turning the tap off to Courtney, b) Tinkerbelle helping Alex turn a tap off.

> This afternoon Tinkerbelle and Raceman I heard how keen you were to conserve water. Tinkerbelle you had asked for the water barrel to be filled up. Once that was done, children wanted to turn all the taps on. As you filled up your teapot with water, you were very adamant and told children "we can only have one tap on at a time". Raceman agreed with you and helped you turn off the second tap that another child had turned on. "We have to respect the water" you said to everyone there at the sandpit.

Both Tinkerbelle and Raceman confidently shared their ideas about ways the group could look after the water resource. They took on a role of teacher to educate their friends to ensure they turned the taps off and in Tinkerbelle's words "respect the water". Evident in this story and several of the other data entries, are the children's use of the word 'we' which shows their strong connectedness to each other and their understanding that they work together, and share in the role of guardian. In a similar scenario Amelia (younger child) supported Nathaniel's learning (an older boy new to the kindergarten) on feeding the worms as seen in the following extract from a learning story for Nathaniel and Amelia, and supported by figure 73.

> When Nathaniel was eating his morning tea he wondered out loud, "where do I put my apple core?" We discussed the poster on the wall beside the kai table that shows us the foods that the worms can, and can't eat. As he was studying the picture list, Amelia joined him. Together they decided that the worms would like Nathaniel's apple core, so into the blue bucket it went. After discussing the worms and seeing other food scraps in the bucket Nathaniel was eager to feed them, but he said he

wasn't sure where the worm farm was. "I'll show you where it is", Amelia offered, and together they headed outside to feed the worms.

Figure 73 - Nathaniel sharing what he has learned from Amelia about feeding the worms.

This is an example of tuakana/ teina in action as Amelia supported Nathaniel in the system of sorting food scraps and feeding the worms. Nathaniel had an awareness of a system for food scraps but he had yet to discover what the system was and how he could contribute to it. In turn Amelia stepped up and took on the role of teacher to show Nathaniel the practice of caring for the worms. Both observations relate to the ecosystem concept of connectedness (hononga), showing how we all play a part on different levels, within the kindergarten community (children, family, whānau and the teachers).

Knowledge transfer is a two way process. Visiting community members learn from the kindergarten's sustainable practices which relates to co-dependency and ensuring a healthy relationship that supports the environment. There are no tangible rewards for children taking

on this role, just a sense of awhi and mana from their peers and the adults within the environment who often give verbal acknowledgement, respect and praise for taking on the role of guardianship for the kindergarten. As seen here in figure 74 and 75, when Tinkerbelle took on the recycling monitor role with Cinders (the kindergarten's teacher aide) and when Sage took on the fish monitor role. Tinkerbelle knew the processes, and placed value and importance on wearing a badge that symbolised her being on duty and taking responsibility.

Figure 74 - Tinkerbelle ready to be the recycling monitor at kindergarten.

Tinkerbelle:	Can I do the recycling Cinders? See I got the recycling badge on, that will be my job. I'll get the green bin. [Tinkerbelle had the recycling monitor barge on ready to do the job.]
Cinders:	Yes please, thanks. Do you need my help? [Tinkerbelle knew which bins to empty into the big recycling bin.]
Tinkerbelle:	Yes you can help me; I'll put the papers in the bin.
Cinders:	I can help move the big bin. Thanks for your help with this big job Tinkerbelle.
Sage:	Joyce, can I be the fish monitor today?
Joyce:	Why not Sage, I'm sure they will be hungry. [Joyce and Sage both head off to the fish tank to get the fish food.]
Sage:	I'll feed them.
Joyce:	You hold your hand out Sage. [Joyce gives Sage some fish food for the fish. Sage lifts the lid to the tank and puts the food in for the fish. She watches for a

bit.]

Sage: I think they are hungry [pause] look they are eating it!

Figure 75 - Sage feeding the fish with some help from Joyce (teacher).

Tinkerbelle had knowledge of what had to be done, and felt confident in her ability to take action and that Cinders (and for Sage that Joyce) will support her and support the processes. Sage observed the need to care for the fish and knew the systems to take action. Davis (1998) asserted that the teacher is crucial in transforming attitudes, values and actions that lead toward sustainable social and environmental relationships. Similarly in order to have a healthy ecosystem there is a need for a set of complex relationships among the living resources, habitats and residents of an area to make it sustainable.

Rogoff et al. (2007) states that participation in sustainable, everyday activities, where learning is understood as collaborative and intentional, enhances a sense of community. In this observation Nathaniel is explaining his choice of taking responsibility for being the water monitor (refer figure 76).

Researcher: What are you doing Nathaniel?
Nathaniel: I am the tap checker today.
Researcher: What do you have to check for?
Nathaniel: I need to check that everyone remembers to turn the taps off.
Researcher: Ah so you are the water monitor today.
Nathaniel: Yes because the taps should be off.

Researcher: What will happen if the taps are not off?
Nathaniel: Then I will turn them off, that's my job today.
Researcher: That's being very responsible Nathaniel.
Nathaniel: Yes we need the water so I need to check all the taps.

Figure 76 - Nathaniel being the water monitor at kindergarten.

Nathaniel showed confidence in himself to take on the responsibility of being the water monitor, and was able to articulate the action he will take while in this role.

Bolstad (2003) argues that the point of 'action competence' is for children to become competent and willing participants both in current action, and in future actions that contribute to the solution. In relation to the ecosystem metaphor, Pickett and Cadenasso (2002) argue that values can be implied metaphorically by the term 'ecosystem':

> Connectedness is one such attribute. 'Everything is connected to everything else' can either be a comforting or a threatening metaphorical description of the ecosystem, depending on one's perspective. Such an idea can express people's value of kinship with nature, or their cautionary approach to natural resources. (p. 6)

During this research, action competence was observed where the children actively worked together to maintain and support the environmental practices of the kindergarten. What was also evident was the value the children placed on the environment (both with plants and small

creatures). This highlighted the children's actions for the environment and the importance and value they gave to the role of guardian. The children's understanding of being guardians of the Earth was co-constructed in the sense that it is a shared role of taking action together. The children's actions showed that team effort is needed to take action, that we learn from each other and we all play an active role in change. This leads me to the second concept of community (hapori) which is multiple interactions (taunekeneke) with the environment and how through these interactions the children co-construct their perspectives on the role of guardian.

5.1.2 Multiple Interactions (Taunekeneke) 'The more the merrier'.

In addition to the concept that we have to all work together, an ecosystem also illustrates the concept of 'the more the merrier' (Nature Works, 2014). It is the relationships between elements that is key and the more connections and interactions the better. This includes acknowledging diversity and recognising how dependent we are on each other. Pickett and Cadenasso (2002) comment that the components of an ecosystem are complex and include multiple interactions within a nested hierarchical structure. This interaction and structure is implied in the basic definition of an ecosystem.

Of relevance is Bronfenbrenner's nested ecological model where children's development is studied within the context or environmental settings which they are experiencing or are linked to both directly or indirectly and through time (Smith et al., 2003). In this research, the children and adults built strong responsive and reciprocal relationships, with people, places

and things. This in turn shapes environmental identities. According to Clayton and Opotow (2003):

> Environmental identities inevitably contain a social component because they depend on and ultimately contribute to social meaning. How we understand ourselves in nature is infused with shared, culturally influenced understandings of what nature is - what is to be revered, reviled, or utilized. Social variables affect how much we are able and choose to focus on the natural environment and how we interpret what we see. (p. 10)

Education for sustainability involves an essential understanding of ourselves, our neighbours, our societal and cultural processes and how we are connected (Davis, 2010a). The children in this research are connected with many different places (and the people) within the community. This includes the local parks, the kindergarten, other early childhood centres, the community gardens, local schools, home, local businesses and churches. This connection is fostered through multiple visits to these places and discussions about these places within their community. The kindergarten encourages the children to be involved in the maintenance and care of some of these places. For example Michelangelo's profile book shows evidence of him being involved in several rubbish hunts in the school grounds, visits to the local reserve, the local stream clean up, fire station visits and, plantings at the community gardens (refer figures 77, 78, 79 and 80).

Figure 77 - Michelangelo, George and Alex discussing where the best places for hanging the bird feeders would be.

Figure 78 - Michelangelo with taonga (natural treasures) which he found at the local reserve.

Figure 79 - Buckets full of rubbish collected at the local stream.

Figure 80 - a) and b) Michelangelo picks up rubbish at the local school.

Interaction within the wider community enables the children to build strong connections, rituals and a relationship with their environment. These visits, conversations and experiences inform environmental identities. Lachlan's mum shares,

> For the last couple of months Lachlan has mentioned his two friends "Tuffy" and "Marty" who live in the clouds. I thought he had made up these two imaginary friends so played along. Every now and then they were brought into conversation and sometimes they were responsible for things happening like blowing rubbish around or bringing black clouds. It wasn't until Lachlan, J and I were talking at kindy the other day that I found out that these two friends were actually "Tāwhirimātea" gods of the wind and storm. Well, things suddenly made sense!!! The mystery of Tuffy and Marty has been solved.

Lachlan had built a relationship with the wind and an understanding of how it influences areas or aspects within the environment. He has shared this connection with his family in a

way he has experienced at kindergarten. Value is placed on experiencing nature and just 'being' in nature at this kindergarten, for example being outside in the rain to experience the puddles it creates in the playground as seen in figures 81 and 82, or lying under the blossom tree to watch the bees work as seen in figure 83.

Figure 81 - Saving a worm found in a puddle.

Figure 82 - Harrison enjoying the puddles in the rain.

Figure 83 - Relaxing and watching the bees work in the cherry tree.

These interactions build strong relationships. Louv (2008) suggests that:

> If children do not attach to the land, they will not reap the psychological and spiritual benefits they can glean from nature, nor will they feel a long term commitment to the environment, to the place. This lack of attachment will exacerbate the very conditions that created the sense of disengagement in the first place - fuelling a tragic spiral, in which our children and the natural world are increasingly detached. (p. 159)

This is true for this kindergarten. The prerequisite for wanting to be a guardian and agents of change for the children goes hand in hand with the value they place on the environment. In addition they co-construct their ideas through the connections and relationships they have built with the place, the people and the environment. This is shown by the relationship between Sleeping Beauty and Margalo. Sleeping Beauty has a strong connection with Margalo, the kindergarten canary. On one occasion she took him home and cared for him

over the weekend. On her return she felt inspired to draw a picture for him as seen in figure 84 and 85.

Figure 84 - Sleeping Beauty reading to Margalo on his visit to her house.

Figure 85 - Sleeping Beauty drawing Margalo a picture to remember his visit.

Researcher:	Sleeping Beauty I was just wondering when you had Margalo at home what were you, what did you do with Margalo?
Sleeping Beauty:	Read him some stories.
Researcher:	Did you? You read him some stories. Why did you want to read him some stories?
Sleeping Beauty:	Because I want to.
Researcher:	Which story did you read to him?
Sleeping Beauty:	The pig was in the mud.

Sleeping Beauty took on the responsibility and care for the kindergarten pet and made strong connections with this creature, both at home and at kindergarten.

All species in a balanced ecosystem have a niche or role and they help to keep the system healthy. This can also be said for the way the children, in this research, interact with their environment and take action, all sharing in the work to maintain a healthy environment. Although this may sound complex, it is an example of the simple concept of multiple interactions among a local group of species. The children seem aware of the active roles they

play within their environment and that they can contribute to their community. For example, Nathaniel and John were discussing why they did not see many birds on their last visit to the local reserve and possible ideas on how to attract birds back into the reserve.

John:	We could take some food for them.
Nathaniel:	Yeah birdfeeders like what we made with R.
Researcher:	You made birdfeeders?
Nathaniel:	Yes, at R's we made some.
Researcher:	We could make some here too, we have done before.
John:	Yes I know, then we can take the food to there and maybe the birds will come eat it.

John and Nathaniel's discussion on how they can take action shows that the children are social actors within their environment. They participate and construct their lives, but also have an impact on the lives of those around them, through contributing to the planning and actions of this group. Hart (1997) explains children's degrees of participation through an analogy of an eight rung ladder. The first rung is manipulation and it rises to the eight rung of child-initiated, shared discussions with adults. In this research the level of participation for the children fitted on the eight rung of Hart's ladder of participation. The children showed confidence in their ideas, assisted by sensitive, observing teachers who were willing to listen and respond to and support the children in their actions. Below is a summary of a learning story Rosie shared about Oliver and his empathy towards the small creatures in his environment and his actions to help them (refer figure 86).

> Oliver noticed that the bug houses in the reserve was all broken up and not cared for by others. "That makes me angry" were his words to Rosie. His frustration and anger towards the offenders were clear and he felt the need to take action. He discussed his ideas with Rosie and a parent helper who also shared her knowledge about the bugs. Oliver decided to rebuild the log houses as much he could and also suggested new logs which Rosie and Oliver sourced and placed in the environment a few days later to help re-establish a home for the bugs in the reserve.

Figure 86 - Oliver trying to fix the broken log.

Oliver had a strong sense of responsibility for his environment and was able to confidently share his ideas for action with the adults around him. Hart (1997) applauds children who initiate their own projects and who demonstrate competence and confidence in their role as members of the community when collaborating with others. At times however children's actions may not reflect this collaboration because of different points of view. For example Alex kicked over a row of cones another child had set up, while wearing a cape he made that signified a caring role[16] (refer to figure 87).

Figure 87 - Lizzy and Alex fixing the cones he knocked over.

[16] Several children made capes to display and share the message of caring for…butterflies, Papatuanuku, birds, trees, and the environment. This idea came from Michelangelo after reading the book Michael Recycle and visiting the school. More under section 'water everywhere'.

Lizzie:	Ah [disappointed tone] that was our cones Alex!
Alex:	They were in the way.
Lizzie:	I put them there.
Alex:	I don't want them there.
Researcher:	Lizzie you might need to explain to Alex why you put them there.
Lizzie:	Because we are working here and you need to watch out.
Researcher:	Do you understand why Lizzie put the cones there Alex?
Alex:	To tell us.
Researcher:	To be careful, so if you kick them away the other children will not know to be careful of Lizzie's work.
Lizzie:	I will fix it.
Researcher:	Alex I think you should help Lizzie, especially seeing that you are wearing your caring cape.
Alex:	Yeah I'll help.
Researcher:	Thanks Alex, and maybe next time you will ask why someone had put the cones out instead of kicking them about. You never know there might be a very good reason.
Alex:	I like using cones too.
Researcher:	Yes you do and would you like it if someone kicked your cones over?
Alex:	No, that would not be nice.
Lizzie:	Yeah that was not nice.
Researcher:	But look now it is all fixed. Lizzie maybe Alex could help you with your digging work?
Lizzie:	Yes he can, we are digging here Alex to fix pipes.
Alex:	Ok!

Alex had a different point of view to Lizzie and his action reflected this, yet this action contradicted his cape message of 'care'. Connection within an ecosystem can be fragile and so too can the interactions between the children, the environment and those around them. In a similar observation, Amelia dropped her unwanted fruit scraps under her friend's chair at lunch. Her friends questioned her actions and reminded her of the song they created for the school children about not dropping apple skins on the ground. Amelia at first seemed reluctant to pick her scraps up but after her peers encouraged her to do this, she did pick it up and placed it in the scrap bucket for the worms. At times, like when Alex kicked the cones or Amelia dropped the scraps, the connection is lost because of impulses or a different point of view, but it is the lessons they learn through these interactions that strengthen parts people play within the ecosystem.

During data collection the children were inspired by Michelangelo and Tinkerbelle who noticed a lot of rubbish on their way to kindergarten and decided to do something about this by picking it up. This became a group interest and reflected the community of practice. This was led by Michelangelo as seen in figure 88. As discussed in chapter four, the children identified strategies to teach the school children about reducing the rubbish within their lunch boxes, which in turn will help reduce the rubbish in the playground.

Figure 88 - Michelangelo leading the morning discussion on how to take action.

Researcher:	What are they signs for?
Michelangelo:	For picking up rubbish, they are my brothers…
Isabelle:	I know… please no wrapped food.
Researcher:	No wrapped food, we talked about it yesterday. Michelangelo and Tinkerbelle came to kindy with rubbish which they picked up on their way to kindy, and we talked about where this rubbish comes from.
Michelangelo:	It was from school.
Isabelle:	Because of all the plastic stuff.
Researcher:	Yeah, so we were talking about it yesterday how at kindy we try not to have wrappers in our lunchboxes
Sage:	No!
Jack:	And we have to pick up rubbish because that is looking after our environment.
Researcher:	You are quite right Jack, and we are trying to stop the problem I think.
Several children:	yeah!...

Researcher:	No so we are trying to teach the school kids how they can be…always wrap free…that's what the sign says, always wrap free.
Jonny:	So we should put that at the school.
Researcher:	So you're thinking we should put that at the school…how would we be able to put it up at the school?
Michelangelo:	No I think we need to hold them up.

Here the kindergarten group is confidently discussing their options to inform their school community on how to reduce their wrappers. Hart (1997) argues that the best opportunities for democratic experiences for children comes from sustained involvement within a group. Mars, Bronstein, and Lusch (2012) explains that

> …organisational ecosystems involve multiple actors that interact both positively and negatively as pairs and group, and flows of resources that can either form or develop out of these interactions… the system as a whole and its various components can show a wide range of resilience in the face of external challenges. (p. 271)

The children show that they are part of their community through their interactions. The children co-construct their understanding of the role of guardians of the Earth through their active participation, being part of a group who works together to effect change. Many different organisms within an ecosystem interact with each other and rely on each other for their energy and existence. Pickett and Cadenasso (2002) discuss energy as a common focus of an ecosystem model, where a flow of energy is required for its maintenance. This leads to the third concept of 'getting along'.

5.1.3 Flow of Energy - Unity (Kotahitanga) 'Getting along'

In this research, the children are active in their interactions, not passive receivers (Dahlberg et al., 2007). At this kindergarten there is an ecological community, together with its environment, functioning as a group. For example, the group had a plan to teach the school

children about being wrap free in their lunch boxes, yet individual children showed different interest levels and participated in different aspects of the overall goal. Reed and Peters (2004) argue that ecosystems are seen to be complex, non-linear, multi-equilibrium and self-organising. This can be said for the way the children all took on different roles within the group to take action towards the overall group goal. Their ideas were complex, yet delicate and had many different layers of involvement and influences supporting their working theories and the flow of energy within.

Figure 89 - Ellie designing a new badge.

Figure 90 - Rose wearing her badge Ellie made her.

Here Ellie (refer figure 89) and Tinkerbelle, took on the role as scribe and badge creators for the group while Rose (refer figure 90) took on the role of wearing the badge and being the person who enforces what her badge is saying.

Ellie:	I can make the badges for you.
Researcher:	That would be great thank you Ellie. What do you think you could draw on this badge to show how we are caring for the environment?
Ellie:	I can draw the Earth.
Researcher:	That is a great idea.
Ellie:	And maybe on this one the playground.
Researcher:	Another great idea.
Rose:	Can I have a badge?
Researcher:	Sure, Ellie finished this one. It is to tell people that you are a

	conservationist.
Rose:	I can do that.
Researcher:	You sure can look after the environment Rose.
Ellie:	I will draw flowers on this one.
Tinkerbelle:	Can I do one?
Researcher:	Sure what would you like to draw on this badge Tinkerbelle?
Tinkerbelle:	I'll draw people.
Researcher:	Why do we care for people?
Tinkerbelle:	Uhm, they are friends.
Ellie:	I will draw everyone's house.
Researcher:	Why is that Ellie?
Ellie:	Because we need to look after all the houses too so we can all live there.

All the children are playing an active role to solve the problem of rubbish in their community. Ellie, Rose and Tinkerbelle clearly value their environment and therefore want to take action. The children showed a working theory that the role of guardian was important because it required a badge. Children not only took action through taking up particular roles of responsibility at kindergarten, but also in their home environments, the community and the places surrounding the kindergarten. Fireman Sam, is fully aware of the procedures at kindergarten in separating the food scraps to feed the worms, but on this day chose to support his (and his families) ideas for making compost at home (refer figure 91).

Figure 91 - Fireman Sam with the food scraps he collected for his home compost bin.

Fireman Sam:	I'm taking my skin home.
Researcher:	Why Fireman Sam?

Fireman Sam:	I'll put it in the compost bin.
Liam:	That's a wooden box Fireman Sam told me. When it is ready we give it to the worms.
Researcher:	Why not give your skins to the worms Fireman Sam?
Fireman Sam:	No I need it for my compost.
Researcher:	Would you like a container for your skins Fireman Sam?
Fireman Sam:	Yes.

Fireman Sam's mum shared about his involvement at home in composting. Penny shared that Fireman Sam often tells her off especially if she forgets to put banana skins in the right bin so he can put it in the compost bin. Penny shared that they do garden and Fireman Sam often helps with this as well as being involved in the composting.

Fireman Sam has taken on the leadership role in teaching his friends about composting, as well as his family at home. He has taken on the responsibility for maintaining his family's composting efforts. Through this established culture within this kindergarten, where children take action within their environment, they have transferred their aspirations (and flow of energy). They act not just as monitors but take action in many other aspects of the kindergarten and in places past the kindergarten fences as well. The children influence their families and in turn their communities to change towards more sustainable thinking and behaviours. The children's understanding of their role as guardian of the Earth are formed through their multiple roles within this community. The children are a unit with a common goal and this creates a flow of energy.

5.2 Conclusion

There are different aspects to the children's involvement, interests, understandings and actions displayed through their role as guardian of the Earth. The children showed areas of the environment they valued as important to conserve, and wanted to protect, while agreeing

that taking action for the environment is a responsibility shared by all. These conversations and interests are supported and extended by the programme and adults within this kindergarten community. Rogoff et el. (2007) state that participation in sustainable, everyday activities, where learning is understood as collaborative and intentional, enhances a sense of community. As a group these different parts and pieces all work together, to create a community that displays a strong ethic of care, and stewardship (Ritchie, 2012) to the Earth, and the people, plants and things on it. This relates to how the children are co-constructing and enacting their understandings about their role as a guardian of the Earth. The children display a reciprocal relationship to "this place", to "the people" and "the things". It is a place where they can tell their secrets, where they can feel, 'be' and make valued contributions and look beyond (refer figure 92).

Figure 92 - Alex and Sage looking beyond the fence and exploring their community.

The children's relationship with nature is the energy that sustains the learning for nature. Yet just like all ecosystems this system is delicate and involves complicated 'parts and pieces' with critical characteristics and relationships needed to ensure its survival. Therefore we all need to say at the top of our lungs: "care for the Truffula trees with its Truffula Fruit. Scrub

the pond where the Humming-Fish hummed and clean up the smogulous smoke so the Swomee-Swans can sing their beautiful note".[17]

[17] From *'The Lorax'* (Suess, 2006)

Chapter 6: Conclusion

"SO…Catch!" calls the Once-ler. He lets something fall. "It's a Truffula Seed. It's the last one of all! You're in charge of the last of the Truffula Seeds. And Truffula Trees are what everyone needs. Plant a new Truffula. Treat it with care. Give it clean water. And feed it fresh air. Grow a forest. Protect it from axes that hack. Then the Lorax and all of his friends may come back."

~Dr Seuss[18]

This concluding chapter highlights what has been learned from listening to the children's perspectives, observing their actions and finding the moments of 'UNLESS' within the kindergarten environment. This chapter revisits the key findings of this study and considers implications for practice. The strengths and limitations of the research are discussed, as are questions for further research.

6.1 Introduction

The metaphor of an ecosystem supported my exploration of the children's perspectives on their role as guardians of the Earth. It is becoming ever more evident that our planet is facing an ecological crisis of frightening proportions, and that as humans we need to radically alter our behaviour if we are to intervene in this calamity (Hansen, 2009). So how can we possibly change our behaviours and years of destructive habits? These behaviours and habits will impact on the children of today and in the future. This research points to the importance of listening to children's voices and taking note of the value they place on the environment, because of the impact it has on them today and in the future. In this study, the children's

[18] From *'The Lorax'* (Suess, 2006, p. 61)

actions, conversations, and perceptions were explored and analysed and conclusions were drawn about the way in which they experienced and made sense of their actions within this community and the kindergarten environment. Although this might sound simple, a deeper look underneath the surface revealed a rather complex ‘ecosystem’. An ecosystem that needs to be protected, treated with care, needs clean water and should be fed fresh air, just like the truffula seeds.

6.2 Key Themes

Four key themes emerged from the data and analysis in this research:

- shared responsibility
- guardianship
- taking action
- community connections

6.2.1 Shared Responsibility

This group of children perceived the role of guardian of the Earth as a task shared by all. They had strong views on this matter and articulated that everyone has a role to play and that we should all do our share to ensure the protection of our Earth. Their views mirror the indigenous, pre-capitalist societies who lived comparatively sustainably over extended periods of time, many fostering non-individualistic values such as cooperation and contribution to the collective, as well as respect for the environment (Magdoff & Foster,

2011). Plumwood (1999) describes this as a pedagogy similarly informed by local indigenous ways of being, knowing and doing, whereby the interconnectedness and interdependence of humans with the more-than-human world is embraced. This is reflected in the children's actions. In relation to the research question, the children's understandings of the role of guardian within this kindergarten encompassed empathy, accountability and recognition of nature. The children embraced this role and showed a sense of community. The children also showed an awareness of their own responsibilities as active citizens. Like an ecosystem, a community (hapori), where all the parts work together was evident. A balanced system with strong connections was to the fore.

6.2.2 Guardianship

The children took the role of guardianship (kaitiakitanga) seriously. The children saw their contributions and active participation as very important and placed significant value on the role of guardian and taking responsibility for their environment. The children showed a culture of care (manākitanga). The children had built an environmental identity within this kindergarten community through being agents of change involved in taking action in, about and for their environment. Thomashow (1995) identified that "ecological identity refers to all the different ways people construe themselves in relationship to the Earth as manifested in personality, values, actions and sense of self. Nature becomes an object of identification" (p. 3). Within this research the children were developing their action competence and reflecting on their ecological identity. The children through their play and working theories were transferring environmental knowledge over space and time.

6.2.3 Taking Action

The children constructed and established relationships enabling them to share their culture of care for the Earth. Their knowledge, thinking and actions were confidently articulated to their peers, teachers, families and to me. The children were empowered and showed agency to take action, teach others (ako) and showed a connectedness (hononga) to people, places and things within this kindergarten community. Riley-Taylor (2003) suggests:

> There is a great potential for agency towards affecting a symbiotic balance between our species and the larger ecological world around us. However, most people remain largely inactive, with eyes closed to the potential role we could play as stewards of a planet inhabited by multitudes of life forms in an ecological balance. (p. 41)

The participants in this research showed that children as young as three and four years old can have their eyes wide open and successfully play the role of stewards, or guardians of the Earth, as referred to in this study. This challenges the notion that children are too young to take action for the environment when given the opportunity.

This kindergarten, as with all early childhood centres, is a complex setting where a multitude of different influences are at work. The children showed a connection and strong relationship with many of the people, places and things that surrounded them within this kindergarten community, therefore moulding their environmental identities and their sense of place. I argue that the children showed a desire to be guardians of the Earth as they have had many experiences where they made strong connections with the ecological world. These experiences and connections impacted on the value they placed on the environment. Riley-

Taylor (2003) commented "that 'separation' as a way of knowing has kept us from experiencing how deeply our lives are interwoven within the fabric of the ecological world" (p. 41). Immersing the children in the environment through experiences helps them form strong connections which in turn helps them value their environment.

6.2.4 Community Connections

The children's value for the environment and their ideas were co-constructed through the connections and relationships they have built within this kindergarten community, the people and their environment therefore weaving the threads that bind them to their place in the world. The children knew that their contributions were valued, that they made a difference and showed confidence in their actions. I argue that the children had an important niche within this ecosystem and showed the energy of unity (kotahitanga) to take action and being ready, willing and able guardians, consequently showing action competence and agency. Mackey (2012) has identified that:

> When our youngest citizens participate in bringing about positive change, they contribute their ideas and understandings of the world around them; are involved in conversations where their voices are heard; work within democratic processes alongside others to find solutions and to take action. (p. 476)

The children within this research were exposed to an environment where their contributions were valued, heard and encouraged and were fully involved in the actions planned and implemented to bring about changes within their kindergarten environment. Collectively the children confidently and competently took action, for example to reduce the litter within their

wider community. This relates to and highlights the relationship between co-constructivist theory and ecological theory. Both theories see learning as socially constructed and recognise the child as a capable, social being that needs to be connected to others in society to develop. Furthermore, *Te Whāriki* (Ministry of Education, 1996) connects with both these theories in its views that the child is central to a series of social systems. It is within these social systems that the children had the opportunity to engage in collaboration, reflection, dialogue, debate, problem solving and action towards a unified goal.

6.3 Implications and Possibilities for Practice

This research has identified a number of strategies relating to integrating EfS into early childhood education. The implications of the strategies are set out under three key themes;

- rethinking pedagogical practice,
- professional development or ongoing teacher education, and
- learning pathways.

Developed during, and in response to, an extreme period of social and environmental change that is impacting on the lives of children and on the education system, this thesis is guided by the statement that "UNLESS someone like you cares a whole awful lot, nothing is going to get better. It's not!"[19]

Several implications for pedagogical practice for ECEfS emerged from this research. Firstly this research argues for the importance of early childhood education for sustainability in

[19] From '*The Lorax'* (Seuss, 2006, p. 58)

upholding our bicultural obligations under the Treaty of Waitangi. It also has implications for teachers relating to supporting children's agency and guardianship (kaitiakitanga). Kaitiakitanga relates to our active obligation to the landscape, its waterways and people. It is informed by the past, provides for the present, and is protected for the future.

6.3.1 Rethinking Pedagogical Practice

6.3.1.1 Changing the Narrative

As teachers and scholars of education we are placed in a powerful position as shapers of narratives which will be taken up by young children and transmitted forward into future generations (Ritchie, 2012). Currently the story of the modernist western globalized culture has led to a separation of humans and nature, where the land and people are positioned in service to 'the economy' (Suzuki, 2010). The western world currently promotes a narrative about our role on the Earth as the tale of culture exceeding nature. This implication is an ethical imperative, and intervention, for early childhood educators to actively engage in changing this narrative (Rose, 2004). Ritchie (2012) insists that as teachers:

> we cannot hide behind the façade of evasion of this responsibility by claiming we determine our programme offerings purely in response to 'children's interest', providing an 'emergent curriculum'- common discourse in early childhood education centres in our country. Children will only be able to access the narratives, experiences and resources which we as a community afford them to access. (p. 86)

A starting point would be looking at indigenous ways of knowing, being and doing. These ways highlight communities living respectfully and responsively within their environment

and their place. I argue that as educators we need to embrace the narrative that nature is us and we are nature. The Māori, the indigenous peoples of Aotearoa New Zealand, do not set themselves apart from nature, believing that:

> cosmology positions people alongside plants, birds and insects as fellow offspring of Papatūānuku, Earth Mother and Ranginui, Sky Father. Constructs such as *mana whenua* (genealogical connection to specific lands), *kaitiakitanga* (guardianship over rivers, lakes and lands), *tino rangatiratanga* (use of authority to ensure the well-being of resources and people), *mauri* (life force of animate and inanimate things), and *wairuatanga* (spiritual interconnectedness) reflect the respectful role of humans within their realm of influence. (Ritchie, 2013a, p. 403)

For teachers to respond to the challenge of changing the narratives, we need to share a discourse of connection and relationship with the environment. Teachers should be active in our engagement with the outdoors facilitating children's sense of relatedness to the Earth and the living and non-living world. There needs to be a pedagogical understanding that these ethical practices of love and care for our world are taught through the local indigenous culture rather than about it. This can be achieved through place-based pedagogies and connecting with local people, stories and places. Education needs to 'reweave' the threads that bind humans to their place in the world, since "education is a prime medium in which to initiate an educational praxis which draws on ecological and spiritual tenets of rationality and connection-making" (Riley-Taylor, 2003, p. 41). Fostering ethics of care and love for the environment (manākitanga) requires that adults challenge dominant constructs of childhood by enabling children to participate and contribute to the issues that affect their lives now, and in the future, as seen in this research.

6.3.1.2 Supporting Children as Agents of Change

This leads me to a further implication for pedagogical practice concerning supporting children as agents of change. There is the need to use transformative teaching and learning approaches relevant to EfS, to empower children to make decisions, and take action and responsibility for their environment. The significant implications with a number of interwoven components of transformative teaching and learning approaches are discussed in this section. The world has entered a period in which the scale, complexity and speed of change caused by human activities threatens the fragile ecological systems on which we depend (Wijkman & Rockstrom, 2012). Given the magnitude of this statement it is vital that we rethink the role of education, in the changing circumstances of the world. Along with this, adults need to rethink their assumptions about young children, their capabilities, and ability to understand the issues and their role as agents of change. There is harmony between early childhood education and education for sustainability as both fields present a holistic approach, consider learning dispositions, focus on working theories, problem solving and inquiry learning. Both fields view the child as an active, capable participant. With Te Whāriki, firmly grounded in ecological and co-constructivist theory, the integration of education for sustainability programmes into early childhood education should be a smooth and unproblematic process.

Young children can be agents of change both today and in the future. In drawing attention to the competencies of young children, this research offers new insights about the understandings young children have on being agents of change and guardians of the Earth. This view is supported by the *Te Whāriki* (Ministry of Education, 1996) aspiration for children to grow up as competent, confident and capable learners and communicators, secure

in their sense of belonging and assured in the knowledge that they make a valued contribution to society. Children's rights as competent citizens are increasingly being recognised. Young children have the right to be involved in issues that concern life now and in the future. If education for sustainability is to be meaningful and successful, it has to be rooted in the local concrete reality of young children (Engdahl & Rabusicova, 2011; Harcourt & Einarsdottir, 2011). *Te Whāriki* can be seen to have a transformative agenda through its principle of empowerment which recognises the rights and dignity of children as individuals (Ritchie, 2010a).

The implication is that teachers need to facilitate learning opportunities for young children that allow for co-operative exploration of the natural world. This encourages the children to be the experts on their learning. There is strong consensus in the literature about the ability of very young children to understand, think critically about, offer creative ideas and solutions to, and even take action on complex environmental issues (Britsch, 2001; Davis, 2005, 2008; Engdahl & Rabušicová, 2011; Gambino et al., 2009; Gerst & Fraser, 2009; Hudson, 2012; Mackey, 2012; Norddahl, 2008; Prince, 2010; Vaealiki & Mackey, 2008). To ensure that children's voices are heard, and that their voices have more influence on policy and practice, attention needs to be drawn to the idea that listening is not only a technique. It is a way of thinking and seeing ourselves in relationship with others and the world.

Children's lives are co-constructed by the actions and relationships they have with key adults in their lives. Deciding which voices are heard, considering reflection on what is being said and the difference it will make are central to adults understanding these actions and relationships (Harcourt & Einarsdottir, 2011). Listening is a necessary stage in participation,

and these terms are interlinked which implies a sharing of power. Young children are best served by changes in practice which remain alert to their differing perspectives and interests, as well as their needs (Clark, 2005a). This is achieved when children experience the tikanga concept of ako, an environment where they are viewed as co-constructors of knowledge and adults are seen as co-learners (Ritchie, 2010a). Adults need to view children as rich in potential, resilient, powerful, competent and most of all connected to adults, their peers and their environment (Dahlberg et al., 2007). Teachers need to reflect on their teaching philosophy, their practice and the teaching environment to ensure they allow for the co-construction of learning pathways that create a sense of wonder and inquiry, time to ponder and opportunities for children to 'be' in and connect with nature.

An implication is that teachers need to engage in environmental experiences with young children and provide 'real life' opportunities where they can take action and care for the environment. From this research, the engagement of children in hands on, real and relevant environmental and sustainability issues of interest to them provided meaningful experiential learning from an enquiry base. This was imbedded in the culture of this kindergarten. These experiences provided effective and powerful learning *in* and *about* the environment and over time *for* the environment as children built their environmental identity. Early childhood centres should provide constant, on-going, experiential learning experiences, in and beyond, their centre environments around education for sustainability. Having a curriculum teaching and learning approach that is play-based with integrated learning and teaching experiences and projects is needed. This will require careful, reflective consideration of the balance of providing experiences in and about the environment and then creating learning environments that enable children to develop their own ideas, working theories and actions for the environment. Teachers will need to allow child-led initiatives to emerge and follow through

and support children in these initiatives. The children will build an attachment and awareness of place enabling children to understand more of themselves and their ecological identity. It will require active listening, responding, revisiting, debate, challenge and a collaboration of ideas within the centre community.

Teachers need to organise a learning environment with effective systems so that children can participate in ongoing sustainable and environmentally friendly experiences and actions. Research by Henderson and Tilbury (2004) indicates that the most likely way to bring about change in educational settings and their practices is through 'whole centre approaches'. This is also seen in this research, as education for sustainability is a team focus and part of this kindergarten community's whole way of being.

An implication for creating a 'culture of sustainability' (Davis, 2010a), is that there needs to be partnerships with the community, where close relationships with families and the centre's wider community and local organisations ensure that learning and teaching for sustainability is an ongoing, two-way process. Democratic-decision making processes need to become part of every-day learning, routines and relationships to enhance a sense of community. Early childhood centres could identify families who engage in environmental practices at home and utilize their skills and knowledge by creating powerful learning environments where families feel they have a place and can contribute. Teachers need to form partnerships with families to review and change the operational practices in the centre so that these practices reflect care and concern for the environment. Children, teachers and parents are competent co-authors in and of a community of learners.

6.3.2 Professional Development

For the key area of professional development, I argue that there is a desperate need for new knowledge across all sectors of education. The need for professional development or further teacher education, both in-service and pre-service is critical to having an impact on education for sustainability, and children's learning in, about and for the environment. Teacher education will enable teachers to go beyond programmes that only address education in and about elements. It would support their transition to a commitment, understanding and passion of education ***for*** the environment and why this is so vital for changing our ways of being. Teachers need support to become fully engaged with the sustainable agenda. Educational programmes (both within early childhood and schools) need to move beyond just focusing on reduce, reuse and recycle to an approach where children participate in critical reflection and take action on wider sustainability issues. There is a need for professional development that focuses teachers, of all educational sectors, on children's agency and competence in regard to exercising care for their environment. Similarly, having pre and in-service support for teachers to encourage education for sustainability, and that explores activism by children and educators in socially and environmentally conscious citizenship is an essential implication for achieving the necessary change in how we affect our environment.

6.3.3 Learning Pathways

Lastly, is the implication of ensuring strong learning pathways for children as they transition from one educational environment to another. The children participating in this research were

exposed to rich, collaborative, child driven intensive learning experience around education for sustainability. This influenced their strong views and actions on being guardians of the Earth. Yet when they transition to school, I question whether the children's prior knowledge and experiences will be acknowledged, valued and built on to maintain their learning pathway. This is a possible topic for a follow up study.

The implications here are important. Failure to maintain and co-construct pathways around education for sustainability in the children's future learning may disempower them, leading to the endangerment of the educational ecosystem. Biss (2012) recommended that strong connections and relationships with early childhood centres and schools are imperative. The children need to feel connected, they need opportunities to reflect and convey prior knowledge and progress on-going thinking and learning around education for sustainability. It is essential that this learning is valued. Therefore, both the primary school and the early childhood centre have a responsibility to the children, and their families, to support further learning pathways. Teachers in both sectors need to reflect on their teaching and learning philosophy and practice to ensure they allow for the co-construction of learning pathways that create a sense of wonder and inquiry for children around education for sustainability. Teachers need to collaborate and share information around sustainable practices that children are leading and involved in, to strengthen and support the children's mana (prestige/ authority). As educators we have a responsibility to uphold the children's mana with regards to their responsibility of guardianship over the domains of the lands, forests, rivers and seas within their communities.

6.4 Strengths and Limitations of this Study

There are strengths and limitations with this kind of small-scale, teacher researcher study. This research might be considered invalid in quantitative scientific research. However, with qualitative research methodology, this research can be read as revealing and valuable for the attention it gives to the particulars of context. By being deeply involved in facilitating the programme that I was researching, my positionality could be seen as presenting a bias. However, by acknowledging my positionality in the research, I have been able to study complexities that could not be identified in the removed, impartial traditional approach. The subjective interpretations employed in the research might be regarded as both a limitation, and as a factor increasing the validity of the findings, in that I was able to draw on knowledge of previous events to help interpret observations. However, I was the only observer and only interpreter of the transcripts, which potentially reduces validity. The research is as robust as possible in that I was able to recognise and address my bias and identify alternative interpretations during discussions with my supervisors. Using the mosaic method also helped reduce bias as it insured triangulation of the data.

Other limitations of this research also include the small size of the project. Given the small sample of one kindergarten, generalisation about my findings across other groups of children or early childhood settings is not possible. Similarly, given the time frame of the data collection period for this thesis and course timeframe, it only allowed a snap-shot of the children's perspectives at that point in time.

Despite these limitations there are several strengths in the research. A definite strength is that the kindergarten and participants were specifically and carefully chosen to suit the purpose of this study. This strategy is consistent with Mutch (2005) who acknowledges that "the sample is chosen for specific reasons to expand our understanding of the phenomena and not to make broad claims" (p. 50).

A key strength of this research is that the research design enabled a strong and consistent focus on the children's voices and understandings of their role as guardians of the Earth throughout all processes. From the outset it was crucial to the aims and purpose of this study that the children's ideas and actions remained central in every aspect of the research process. I observed empowered children who wanted to share their ideas, who were keen to participate in discussion and often eager to revisit their recordings. I went to great lengths to ensure the children understood what I was doing, what they were participating in and what they were consenting to do. I believe the children felt safe and comfortable to be themselves and share freely their ideas and thoughts on the topic. As a teacher at this kindergarten I had already built strong, trusting relationships with them and the data collection took place in their own familiar context. The research design supported this level of children's participation and I believe this resulted in useful and meaningful data for this study.

6.5 Research Opportunities

A possible future research opportunity using a similar study design, but within an early childhood environment where education for sustainability is not such a key feature of the curriculum, would make an interesting comparison potentially revealing how much the

kindergarten programme and community impacted on this group of children's understandings and actions of the role as guardians of the Earth. It would help make clear the importance the role of the education provider, the family, and the community has on children taking action for the environment.

In undertaking this research project, possibilities for complementary research have emerged. This research would be complemented by a longitudinal study. As I have been undertaking this research, I have been able to observe ongoing practices and interactions while the children are at kindergarten and as they transition to school. It would be very valuable to be able to follow these children over a prolonged period of time to see if their perspectives, understandings and actions change, and if so what the possible reasons for this might be. This would help in continuing strong learning pathways extending from early childhood education through the transition to school to tertiary level.

Also a study focusing on children's understanding of being co-habitors of the Earth would support bridging the gap of research on education *for* the environment especially focusing on te ao Māori wisdom of connectedness with nature. Davis (2008) argues that one of the most important areas for ECEfS research is case study research into existing, successful ECEfS programmes. "This is important because such studies have the potential to be most helpful to practitioners through: (a) identifying what works, why and how; (b) outlining opportunities for and barriers to successful implementation of ECEfS; and (c) providing inspiration for others to 'have a go'" (p. 3).

6.6 Final Thoughts

In light of the increasingly critical state of our planet, early childhood educators are ideally positioned to enrich the awareness of children, families and the community about the need for humanity to reassess its interface with the more-than-human world. Offering young children opportunities to experience and engage in what nature has to offer fosters an ethic of empathy and a way of being, knowing and doing within nature that reflects a sense of care. Thomas King (2003) has pointed out that telling different stories can facilitate different ethics. Let us learn from these children about how to tell a story of connectedness, responsibility, manākitanga and aroha that extend to include the Earth and beyond. In the words of Dr Seuss~

> *"But now," says the Once-ler, "Now that you're here, the word of the Lorax seems perfectly clear. UNLESS someone like you cares a whole awful lot, nothing is going to get better. It's not.*

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Appendices

Appendix A: Information Sheets for Participants

Telephone: +643 3252700
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Date:

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information Sheet for Children
(For the Parent/ Teacher to read to the child)

I (Jeanne) am doing a research project at the university. A research project is when someone writes stories about things you know about and investigates ideas people have. For my research project, I will be talking with you, your parents and the teachers about your ideas on caring for the kindergarten environment, our gardens, worms and animals, save water and recycle rubbish. I will be doing my research for four weeks at kindergarten. When I am being the researcher, I will be wearing my researcher monitor badge so that you know what I am doing. For this project you can choose a special pretend name for you to use when I write about your work and ideas.

I will watch you play, record your conversations with your friends and teachers, write notes about what you do, what you know and your ideas about caring for all the things at kindergarten. I will take photos of your work, ask you to make copies of your art or buildings and take photos while you play. This will be recorded on my computer so we can look at it again. I will talk to you about your ideas and this will be recorded on my computer, so we can listen to it again. I might copy learning stories from you profile book about your work in caring for the environment. I will also talk to the other teachers, and your parents to see what they think will help with finding out children's ideas about caring for the Earth. During this time, everything will be just the same at kindergarten, nothing will change.

I know that sometimes it can be difficult to talk to someone when you are busy with your work or want to do something else. I will understand if you do not want to talk to me, if you don't want your photo taken or if you start to talk and then you don't want to anymore, that's okay. Our kindergarten is famous for the good work we do in caring for our environment and because we all work together and share our ideas, I cannot promise that other people will not know who you are or who our kindergarten is for this project. I will be making sure that I only use your pretend name in all my writings and when I talk to other people, and only myself and my teachers will be reading my notes. I would like to tell other teachers and people about all the great things you know and do here at kindergarten, and it would be great to use some of the photos and you're learning stories to show them. I will be sharing the findings of this project with you, by making a picture book that you can read.

Your parents and teachers have also been asked to help. If you have any questions, you can talk to your parents or talk to me. If you change your mind about being part of this project, that is fine, too. All you have to do is to tell your parents or come and tell me.

Thank you for thinking about helping me with this project.

Jeanne Williams

Telephone: +643 3252700
Email: jeanne.williams@kidsfirst.org.nz

Date:

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information Sheet for Parents

I am studying towards my Masters of Education at the University of Canterbury. As part of my Masters, I am currently conducting a research project concentrating on education for sustainability with the focus on children's perspectives on their role as 'guardians of the Earth'.

I am writing to ask if you will agree to you and your child taking part in this study. Your child's participation will involve me talking to them about their ideas, knowledge and thoughts about their role in caring for the environment and being agents of change in their community. This will be done in their daily play at kindergarten, where I will take digital photos while they play and of their work, photocopy their art work, digitally record their conversations with myself, the other teachers and or their peers, copy learning stories and make written observations as they participate in the kindergarten's programme. Your child will not be asked to do anything out of the ordinary from their normal daily kindergarten routine. For your participation I might need to ask you some questions about your child's play and ideas to gain a bigger picture about their knowledge and experiences beyond the kindergarten gates. This will be done at the end of session or at a time that best suits you and would take no more than 15 minutes of your time. These conversations will be anecdotally recorded. I am planning to collect data over a four week period.

Please note that participation in this study is voluntary, and you and your child are under no obligation to participate. If you do participate, you and your child have the right to withdraw from the study at any time and may do so without any given reason. If you withdraw, I will do my best to remove any information relating to you, providing this is practically achievable.

I will take particular care to ensure the confidentiality of all data gathered for this study. Only myself and my two supervisors will have access to the data gathered for this study. Please note that Kidsfirst Kindergartens Lincoln is known because of the success it has had through the Enviroschools programme and therefore I cannot guarantee anonymity of the kindergarten for this study. I have met with the Kidsfirst association staff and they have given permission to be named as supporters of this research project. This might also mean that I cannot guarantee your or your child's anonymity in our kindergarten community, as children will work together and share ideas during this study and there is the possibility that children and families might be able to identify each other in this study. I will however take care to ensure that you or your child's name will not be used in any of the publications or presentations. You and your child will be given the opportunity to choose an alias that will be used for this study. I would like to have the opportunity to use photos and possible copies of learning stories for presentations and publications. All the data and copies of the children's work will be securely stored in password protected facilities and locked storage for five years following the study. It will then be destroyed.

The results of this research may be used for related conference papers or journal articles. All participants will have access to the study as a public document, available through the University library. I will be making an illustrated book for the children to share the findings of this study with them.

If you have any questions about the study, please contact me. This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee, and if you have a complaint about the study, you may contact the Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you agree to your participation in this study and for your child to be observed, their learning stories to be used, conversations to be recorded, work to be photocopied and photographed while playing, please let me know by completing the attached form and returning it to me by the 13th May 2013.

Thank you very much for taking the time to consider this request.

Jeanne Williams

Telephone: +643 3252700
Email: jeanne.williams@kidsfirst.org.nz

Date:

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information Sheet for Teachers

I am studying towards my Masters of Education at the University of Canterbury. As part of my Masters, I am currently conducting a research project concentrating on education for sustainability with the focus on children's perspectives on their role as 'guardians of the Earth'.

I am writing to ask if you will agree to take part in this study. I will be recoding every day play and interactions at the kindergarten that relates to education for sustainability. There is the possibility that you could be the adult involved in the activity at the time, which means that I will be recoding your conversation digitally as well as could be taking your photo. I might ask you some questions about the children's ideas and discuss a learning story you might have written about the child/ren, to gain a bigger picture about the children's knowledge and experiences at kindergarten. This will be done at the end of session or at a time that best suits you, and would take no more than 15 minutes of your time. These conversations will be anecdotally recorded. I will be collecting data over a four week period.

The children's participation will involve me talking to them about their ideas, knowledge and thoughts about their role in caring for the environment and being agents of change in their community. This will be done in their daily play at kindergarten, where I will take photos, photocopy their art work, digitally record their conversations with myself, with you and or their peers, copy learning stories and make written observations as they participate in the kindergarten's programme. The children will not be asked to do anything out of the ordinary from their normal daily kindergarten routine.

Please note that participation in this study is voluntary and you are under no obligation to participate. If you do participate, you have the right to withdraw from the study at any time and may do so without any given reason. If you withdraw, I will do my best to remove any information relating to you, providing this is practically achievable.

I will take particular care to ensure the confidentiality of all data gathered for this study. Only myself and my two supervisors will have access to the data gathered for this study. Please note that Kidsfirst Kindergartens Lincoln is known because of the success it has had through the Enviroschools programme and therefore I cannot guarantee anonymity of the kindergarten for this study. I have met with the Kidsfirst association staff and they have given permission to be named as supporters of this research project. This might also mean that I cannot guarantee your or the children's anonymity in our kindergarten community, as we work together and share ideas during this study and there is the possibility that children, families and colleagues might be able to identify each other in this study. I will however take care to ensure that your name will not be used in any of the publications or presentations. You will be given the opportunity to choose an alias that will be used for this study. I would like to have the opportunity to use photos and possible copies of learning stories for presentations and publications. All the data and copies of the children's work will be securely

stored in password protected facilities and locked storage for five years following the study. It will then be destroyed.

The results of this research may be used for related conference papers or journal articles. All participants will have access to the study as a public document, available through the University library. I will be making an illustrated book for the children to share the findings of this study with them. If you have any questions about the study, please contact me. This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee, and if you have a complaint about the study, you may contact the Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you agree to participate in this study, please let me know by completing the attached form and returning it to me by the 13th of May 2013.

Thank you very much for taking the time to consider this request.

Jeanne Williams

Telephone: +643 3252700
Email: jeanne.williams@kidsfirst.org.nz

Date:

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Information Sheet for the Kidsfirst Kindergartens Association

Dear Sherryll, Raewyn and Nicki,

Thank you for meeting with me to discuss my thesis that is concentrating on education for sustainability with the focus on children's perspectives on their role as 'guardians of the Earth. This study is for my Masters of Education at the University of Canterbury. At this meeting it was agreed that Kidsfirst was happy to be acknowledged as supporters of this study, and that Kidsfirst Kindergartens Lincoln could be used for the setting for this research project.

As discussed, the children's participation will involve me talking to them about their ideas, knowledge and thoughts about their role in caring for the environment and being agents of change in their community. This will be done in their daily play at kindergarten, where I will take digital photos of the children at play, photocopy their art work, digitally record their conversations with myself, their peers and other teachers, copy learning stories and make written observations as they participate in the kindergarten's programme. The children will not be asked to do anything out of the ordinary from their normal daily kindergarten routine. Parents and teachers will be asked to participate in the study as I might need to ask questions about the children's play and ideas to gain a bigger picture about the children's knowledge and experiences beyond the kindergarten gates. This will be done at the end of session or at a time that best suits the parents and teachers and would take no more than 15 minutes of their time. These conversations will be anecdotally recorded. I am planning to collect data over a four week period.

Please note that all participation in this study is voluntary and no one is under any obligation to participate. All participants have the right to withdraw from the study at any time and may do so without any given reason. If anyone withdraws from the study, I will do my best to remove any information relating to them, providing this is practically achievable.

I will take particular care to ensure the confidentiality of all data gathered for this study. Only myself and my two supervisors will have access to the data gathered for this study. As we discussed at our meeting, I will not be able to guarantee full anonymity for this study because Kidsfirst Kindergartens Lincoln is well known for the success it has had through the Enviroschools programme. This might also mean that I cannot guarantee anonymity of the participants in the kindergarten community, as children will work together and share ideas during this study and there is the possibility that children, families and or colleagues might be able to identify each other in this study. I will however take care to ensure that no participants' names will be used in any of the publications and presentations. Participants will be given the opportunity to choose an alias that will be used for this study. I would like to have the opportunity to use photos and possible copies of learning stories for presentations and publications in the future. All the data and copies of the children's work will be securely

stored in password protected facilities and locked storage for five years following the study. It will then be destroyed.

The results of this research may be used for related conference papers or journal articles. All participants will have access to the study as a public document, available through the University library. I will be making an illustrated book for the children to share the findings of this study with them. If you have any questions about the study, please contact me. This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee, and if you have a complaint about the study, you may contact the Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Thank you very much for taking the time to meet with me and for allowing me to undertake this study at this kindergarten. Your support is greatly appreciated.

Jeanne Williams

Appendix B: Consent Forms for Children, Parents/ Whānau and Teachers

Telephone: +643 3252700
Email: jeanne.williams@kidsfirst.org.nz

Date:

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Consent form for child

My parent/teacher has told me about Jeanne's project and read her letter about the project to me.

I am happy for Jeanne to talk to me about my ideas on caring for the Earth and making changes in the environment. Jeanne can take my photo when I am playing, use my learning stories, record my conversations with her, my other teachers and my friends, make notes about my play and make copies of my artwork and constructions at kindergarten, to help her with this project.

I know that any information collected about me will only be shared with Jeanne's teachers and no one else and will be stored away in a locked cabinet. Jeanne will also not use my name or my parents or teachers names in her project. I know that all my good ideas I have shared with Jeanne will be kept in a safe place till I am about 9 or 10 years old. Then Jeanne will destroy all the information collected. I know that Jeanne would like to share her work with other teachers and people who want to know about my ideas and that she might like to use my photos, copies of my artwork or learning stories to show them. Jeanne will share the findings of her project with me, by making a picture book that I can read.

I understand that I can change my mind about being in this project and no-one will mind.

I know that if I have any questions I can ask my parents, teachers or Jeanne.

I agree that Jeanne can use the following information about me in the research project, in related publications and presentations and in an illustrated book for the children that will become the property of the kindergarten (please circle appropriate response)

Digital photos	Yes/ No
Copies of my learning stories (names will be changed)	Yes/ No
Photos and photocopies of my work	Yes/ No
Recordings of my conversations	Yes/ No
Observations of me	Yes/ No

Child's Name: _____

Signed by child (or on behalf of child) - parent/whānau signature: _____

Date: _____

My pretend name: _____

Telephone: +643 3252700
Email: jeanne.williams@kidsfirst.org.nz

Date:

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Consent form for Parents/whānau and their children

My child and I have been given a full explanation of this project and have been given an opportunity to ask questions.

I understand what will be required of me and my child if we agree to take part in this project.

I understand that my child and my participation are voluntary and that we may withdraw at any stage without any given reason or penalty.

I understand that any information or opinions we provide will be kept confidential to the researcher and her supervisors. I understand that Jeanne is unable to guarantee my or my child's identity or the kindergarten's anonymity because of the setting and the nature of the study. I understand that Jeanne would like to use photos, copies of learning stories or my child's work in publications and or presentations. I understand that Jeanne will be sharing the findings with the children by making an illustrated book for the children to read.

I understand that all data collected for this study will be kept in locked and secure facilities and will be destroyed after five years. I understand that the study will become a public document available through the University library for my information. I have provided my email details below for Jeanne to contact me with details on how to access a copy of the study.

I understand that if I require further information I can contact the researcher, Jeanne Williams. If I have any complaints I can contact the Chair of the University of Canterbury Educational Research Human Ethics Committee.

By signing below, I agree to participate and for my child to participate in this project, and that I have read the information letter to my child and talked to them about this project.

I agree that Jeanne can use the following information about me and my child in the research project, in related publications and presentations and in an illustrated book for the children that will become the property of the kindergarten (please circle appropriate response)

Digital photos	Yes/ No
Copies of my child's learning stories (names will be changed)	Yes/ No
Photos and photocopies of my child's work	Yes/ No
Recordings of my child's conversations	Yes/ No

Observations of my child	Yes/ No
Anecdotal observations of my conversations with Jeanne	Yes/ No

Name: _____

Alias: _____

Date: _____

Signature: _____

Email address: _____

Please return this completed consent form to Jeanne Williams by the 13th of May 2013.

Thank you.

Telephone: +643 3252700
Email: jeanne.williams@kidsfirst.org.nz

Date:

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

Consent form for Teachers

I have been given a full explanation of this project and have been given an opportunity to ask questions.

I understand what will be required of me if I agree to take part in this project.

I understand that my participation is voluntary and that I may withdraw at any stage without any given reason or penalty.

I understand that any information or opinions I provide will be kept confidential to the researcher and her supervisors. I understand that Jeanne is unable to guarantee my identity or the kindergarten's anonymity because of the setting and the nature of the study. I understand that Jeanne would like to use photos, copies of learning stories or the children's work in publications and or presentations.

I understand that all data collected for this study will be kept in locked and secure facilities and will be destroyed after five years. I understand that the study will become a public document available through the University library for my information I understand that Jeanne will be sharing the findings with the children by making an illustrated book for the children to read. I have provided my email details below for Jeanne to contact me with details on how to access a copy of the study.

I understand that if I require further information I can contact the researcher, Jeanne Williams. If I have any complaints I can contact the Chair of the University of Canterbury Educational Research Human Ethics Committee.

By signing below, I agree to participate in this project, and that I have read the information sheet about this project.

I agree that Jeanne can use the following information about me in the research project, in related publications and presentations and in an illustrated book for the children that will become the property of the kindergarten (please circle appropriate response)

Digital photos Yes/ No

Recordings of my conversations with the children Yes/ No

Observations Yes/ No

Anecdotal observations of my conversations with Jeanne Yes/ No

Name: _____

Alias: _____

Date: _____

Signature: _____

Email address: _____

Please return this completed consent form to Jeanne Williams by the 13th of May 2013.

Thank you.

Appendix C: Table of Analysis Themes.

Theme:	**Relative to Research Questions:**	**Education for Sustainability:**	**Forms of evidence:**
Connected	• Dependence on each other • Shared responsibility • Community • Value nature • Sense of wonder	❖ Agency ❖ Action competence ❖ Engagement ❖ Ako ❖ Participation	➢ Photos ➢ Observation ➢ Learning Stories ➢ Art work
Relationships (whanaungatanga)	• Diversity • Complexity • Fragile • Responsibility • Contribution • Community	❖ Multiple interactions ❖ Agency ❖ Contribution ❖ Social actors ❖ Take action	➢ Photos ➢ Observation ➢ Learning stories ➢ Parent Interviews
Unity (kotahitanga)	• Active • Function as unit • Complex • Layers of involvement	❖ Agency ❖ Empowered children ❖ Complex ❖ Different roles ❖ Future focused	➢ Observation ➢ Learning stories ➢ Photos ➢ Parent Interviews
Culture/ Identity	• Co-construction- shared experiences • Enacting their ideas • Safety	❖ Identity ❖ Diversity ❖ Democracy	➢ Photos ➢ Art work ➢ Observation ➢ Learning Stories
Ethic of care (manākitanga)	• Strong values, empathy, respect and compassion • People, places and things • Can do attitude • Best intentions	❖ Collective action ❖ Problem seeker/ critical thinkers ❖ Ako ❖ Agency ❖ Action competence	➢ Observation ➢ Learning stories ➢ Photos ➢ Art work
Active citizens	• Child led • Agency • Problem solvers • Critical thinking • Leadership	❖ Right holders ❖ Participation ❖ Agency ❖ Interdependence	➢ Observation ➢ Photos ➢ Learning Stories
Critical thinking	• Leadership • Teaching each other (Ako) • Working theories	❖ Collective action ❖ Shared meaning making ❖ Problem seekers ❖ Agency	➢ Observation ➢ Photos ➢ Learning Stories ➢ Art work

Appendix D: Study Findings: A Book for the Children.

“I could be the king of rubbish.”

Children’s perspectives on their role as ‘guardians of the Earth’.

Written by Jeanne Williams

2015

Acknowledgements:

To the amazing children I have taught and who allowed me to take a deeper glimpse into your world, thoughts and ideas, I thank you from the bottom of my heart. It is you who have inspired me the most and made me realise the importance that we need to stop, listen, take note and act on these moments of 'UNLESS'. No longer can the voices of our youngest citizens be ignored. They are the important people who can make a difference now and in the future. To all the participants of this study, I thank you for your enthusiasm and time and commitment you gave to this research.

To the children …

When you were at kindergarten you helped me with my University studies. You shared your thinking, ideas and actions with me on being 'guardians of the Earth'. This helped me to understand your ideas about being guardians and action takers. You also showed me how much you value the environment.

Thank you so much for all your help with my research. I really enjoyed working with you and I have learnt so much from you.

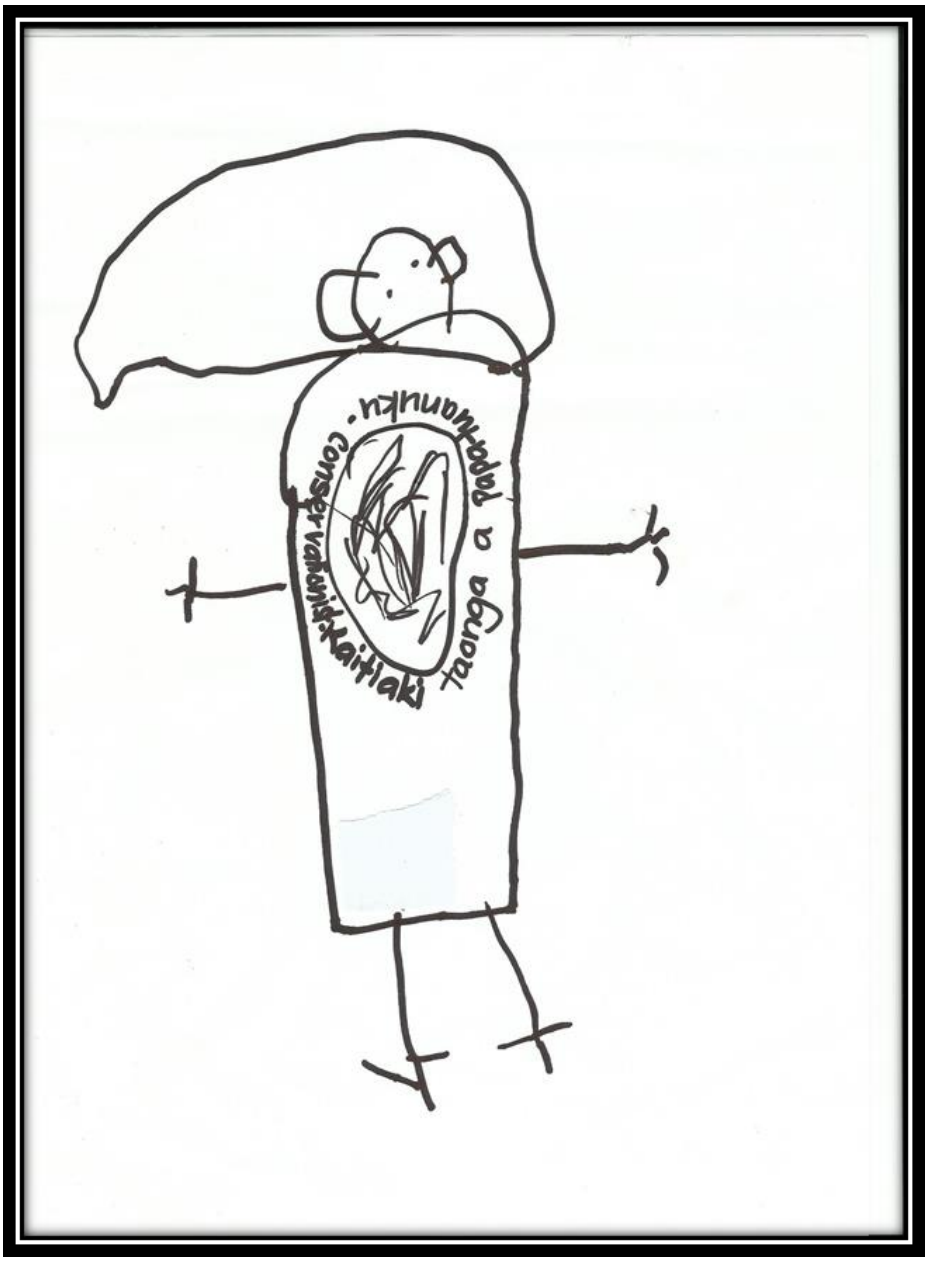
This is what I found out from you…

“I could be the king of rubbish.”

Children’s perspectives on their role as ‘guardians of the Earth’.

Written by Jeanne Williams

To be a guardian of the Earth you need a cape...



To be a guardian of the Earth you need a badge...

Because being a guardian of the Earth is a very important job. Equal to the importance of a king or a superhero.

It is a job that we all need and have to do together. We are part of a team. Taking care of Papatuanuku/ the Earth takes responsibility and is a big job.

You showed me that you cared a whole lot about the Earth…

You care because the Earth is where we all live and it is important to you.

I noticed that you had time to wonder, explore and connect with your environment.

You had time to play and learn with your friends in and about nature. You learned about bugs, mud, rain and trees. You learned how to make compost and care for the gardens.

I think this made you want to care for your environment and take action when you noticed a problem.

You wanted a safe, tidy and healthy Earth; now and in the future when other children use the kindergarten.

You cared because you have learned how, and were given the tools and time to teach others.

You knew that you could be the king of rubbish, because you made a difference!

You are guardians of the Earth.

You are kaitiakitanga!